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COTTON

Volume LXXIX
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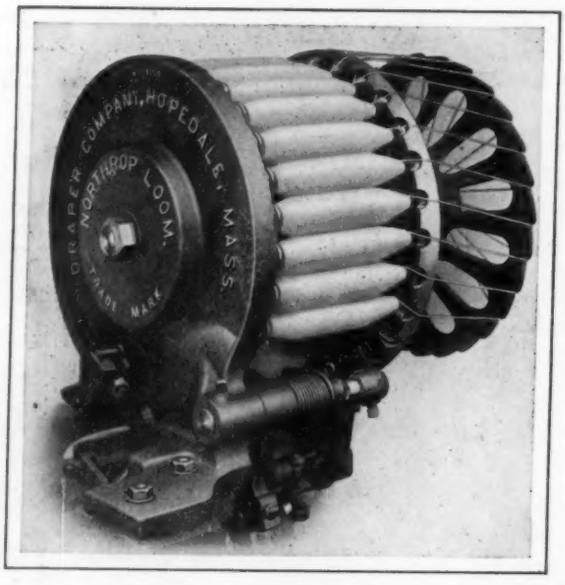

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COTTON

Published Monthly

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SOME EFFECTS OF THE WAR.

The immediate and ultimate effects of the war in Europe on the textile industries of Great Britain and the Continent are subjects of particular interest in this country at the present time and for this reason we are now devoting space and will continue to do so from time to time, to comments and opinions by men abroad who are in close touch with the situation.

In a personal letter to COTTON'S editor a well-known textile authority in Great Britain says in part:

"It is, of course, impossible for any one to be able to state definitely what may happen to the various textile industries as a result of this unfortunate war. The industries of the United Kingdom appear to be more favorably placed with regard to employment than do those of Germany and Austria, although one must not lose sight of the fact that these two latter countries bought much of our partially manufactured and wholly manufactured goods, and at the same time provided us with somewhat similar merchandise. The class of textiles which have been imported into Great Britain heretofore, will now probably be manufactured for some time at least, in the British Isles, indeed events prove that such manufacturing to some extent has already been commenced.

"Certain British textile centres are likely to prosper in virtue of the altered conditions, while other districts are bound to suffer for some time. Thus the heavy woolen district of Yorkshire competed with Germany in several types of cheap clothing fabrics; the German competition cannot be quite so acute at present as formerly and hence the British firms appear to be certain to derive some benefit from this source, in addition to the boom which has suddenly arisen for large quantities of army clothing, rugs and blankets. As a matter of fact many firms are working night and day in the heavy woolen district in order to cope with the demand. The districts where hosiery yarns are spun and hosiery fabrics knitted will also be busy for some time. Some mills are booked up for six months and more. On the other hand, however, the worsted spinning districts of Yorkshire are certain to be hard hit, for large quantities of worsted yarn were spun in the Bradford district and woven into cloth in Germany. This particular trade with Germany has obviously closed for the present, and one would imagine that it will not be revived to any great extent for a considerable time.

"It is quite impossible to say what may happen to the cotton trade. Unless Germany and Austria have provided themselves with huge quantities of raw material it is difficult to see what may transpire. At present the cotton manufacturers in Great Britain are reducing their output, and there are several thousands unemployed in this industry. A great business between those countries

engaged in war existed before the war, and the cessation of business in the cotton industry accounts for most of the decreased output, although the insurance rates for risks on the sea are sure to have exercised a detrimental effect on exports of manufactured goods. This business, however, will ultimately recover, but in the meantime there is the problem of dealing with the raw material. The circumstances appear to offer a very favorable opportunity for creating a reserve of raw cotton as suggested by Sir Charles Macara, and thus place the cotton industry on a much more favorable footing than obtains at present."

It might be well to note parenthetically that since the letter from which we are quoting was received, the British Ambassador at Washington has issued the formal assurance from his government that cotton is not on the list of contraband and will not be seized. This will permit the safe movement of American cotton to any point where a market may be found, including Germany. The letter continues:

"More difficulties are being experienced with flax than with cotton or wool. By far the largest flax growing center is Russia, and even if the fibre has been gathered, there are few opportunities of conveying it from the various centres to Great Britain and other places. Similarly, operations have been suspended in the flax growing centres of Belgium, but it is gratifying to see that the American authorities are using their influence to provide a means for saving and gathering the crops. If this is successful it will make a great difference, with regard to employment, in those centres where fine yarns are spun and fine cloth woven."

The influence referred to was the statement made by Belfast (Ireland) manufacturers that owing to representations made by the United States, the German Government has ordered that no attempt be made to destroy the huge flax stores at Courtrai and Tourquoing, districts in which American people are keenly interested, and with whom Belgian merchants do considerable business. The Ulster linen trade is also reported to have improved to such an extent that powerloom manufacturers have decided to increase the working hours per week from 40 to 45, chiefly owing to the urgent demand for delivery of government contracts. This means increased employment for 30,000 operatives.

"The main districts in which silk throwing and weaving are practised are more or less removed from the seat of war," continues the letter, "for it cannot be said that China, Japan, Italy and the South of France are affected to the same extent as the northern part of Europe. There are, of course, depressions on account of the difficulty of carrying on business with Paris, but on the other hand, the demand in Great Britain for silk goods of British manufacture will continue to increase until the continent assumes its normal aspect. The demand for small silk flags, buttons, etc., for patriotic purposes is large, but this business is merely for a short period. The unsettled state of Europe will probably be the means of causing a large variety of British made silk goods to be placed before the buying public.

"One would naturally expect that the jute industry would benefit as much as any of the others, and more than most. There is always a great demand for jute cloth in times of war, and, although it may be a difficult matter for manufacturers to supply new cloth to replace that which has been utilized for military purposes, still all stocks must be getting depleted and will require to be replenished in the near future. According to the jute reports, and from natural assumptions, it would appear that little, if any raw jute will find its way into Austria and Germany for sometime. The jute industries in these countries must consequently suffer, while on the other hand there should be an abundant supply of comparatively cheap jute for Great Britain—mostly Dundee—and for those countries which are not engaged in war. So long as Great Britain and her allies can keep the trade routes open we may expect to receive sufficient supplies of raw material of various kinds, and also to be able to export our manufactured products. The shipping will naturally be curtailed on account of the increased rates for sea insurance, but this should improve shortly, and the difficulty and sometimes impossibility of dispatching goods to various markets we may expect to be removed.

"The various countries will still require clothing of all kinds and if it is impossible to obtain it immediately it will be demanded ultimately. Great efforts are being made by the leaders in almost all the important industries in Great Britain to accommodate themselves to the altered conditions which always accompany a change from peace to such disastrous outbreaks of war. Many are attempting to supply the markets which have formerly been supplied for the most part by Germany and Austria, and in addition some are directing their operations with the view of providing the domestic trade with merchandise which has usually been more or less a monopoly of Germany and Austria.

"There has been a considerable trade between Great Britain and Germany in dyewares and chemicals generally, and although there are a few high-class chemical manufacturers in Great Britain, they will scarcely be able to meet the demand for these products for some time. And even what is supplied will no doubt be at enhanced prices. The circumstances, however, offer great facilities for extensions in these industries, and those interested may safely be left to look after their own interests. It is a great opportunity, and the problem of development will unquestionably be successfully attacked.

"The destruction on the Continent of all kinds of buildings and industrial establishments, though much to be regretted, will withdraw large quantities of machines from competition. This for a time will place Great Britain and other countries in a favorable position, for they will not only reap the advantage caused by a greater demand on their machines, but the machine makers of all kinds will take part in the boom which must ultimately arise after the war in spite of the impoverishment of the belligerents.

"It will, of course, be quite well understood that any gain in trade will be very small in comparison with the loss which will result because of the war. The loss to every one of the countries at war will be enormous, and the benefits to be obtained, while quite legitimate under the circumstances, will on the whole be infinitesimal compared with the loss. Peace conditions would have suited the British manufacturers very much more than any gain, however large, which might occur through this unfortunate and very much to be deplored war."

Recent reports to the International Federation of Master Cotton Spinners' and Manufacturers' Association, Manchester, Eng., from various European textile centres show

varying developments as a result of the war. The following are extracts from these reports:

Casimir Berger, treasurer of the International Cotton Committee and Member for France says:

"Our districts of the North and the Vosges are occupied and the entire work of all industrial establishments there is at present suspended. Heaven knows when they will be able to resume work under normal conditions.

"Here in Normandy we are in a somewhat better situation, as we are able to obtain a cotton supply through the Seine and to forward our yarn and cloth by way of the canals to the interior of France.

"Under those conditions, our weaving sheds have been able to execute very important orders for the supply of the army.

"Business in the spinning section will to some extent revive when the weaving sheds have exhausted their stocks of yarn and will be obliged to give out new contracts to the spinners. At present the spinning industry of Normandy works short time, which may be estimated at about 50 per cent of the normal production.

"Just as Lancashire spinners, so far we are much concerned as regards the position of the raw cotton market."

John Syz, vice-president of the International Cotton Committee and Member for Switzerland on the International Committee, writes:

"A few spinning mills had to close with the declaration of war, as the managers and head men were called away by military duties. Almost all these mills have since resumed work in a limited way.

"In the weaving sheds the same obtained, but where work was stopped it has not been resumed since and there is quite a number of sheds closed partly because the export industry in fine goods has come to a standstill. The master spinners and manufacturers had a meeting in the first days of August and resolved to do their utmost in order to keep the factories running and to provide work for their hands, as it was considered that this was the only way to ward off misery. It was recommended to work half time everywhere so as to be able to give employment as long as possible. This has been carried out and the reduction varies between 25 to 50 per cent in the spinning mills and is mostly 50 per cent in the weaving department.

"The question how to get the new supplies of Egyptian and American cotton is now the order of the day. Our government has forbidden the export of cotton so that Germany and Austria cannot get it by way of Switzerland. In doing so the objection to letting Switzerland have a new supply should be removed and no obstacle put in the way of ships bringing cotton to French or neutral ports for our country.

"Switzerland is an importer of considerable quantities of English yarns, and just now none is coming in, as the German ports are closed and the English shippers seem to be afraid to ship by way of Rotterdam. It seems to me that it would be in the interest of the English export trade to organize a regular service with the Continent, and perhaps your government could be interested in it. After having lost such a big trade with the war-stricken countries, it seems to be of increased value to keep up the trade with the neutral states, even if it were only to provide work for the people in the cotton industry."

The following is taken from a letter from E. Calvet, member for Spain to the International Cotton Committee:

"Since the declaration of war, the spinning mills have been reducing their output, and the manufacturers took the same step shortly afterwards. At the present time both the spinning and the weaving mills are working three days per week, and hardly any sales take place. It is anticipated that this curtailment of output will last at least three months, as the opinion is held that the war will be a long one."

The latest report on the cotton spinning and weaving industry in South Germany, which appears in the *"Frankfurter Zeitung,"* states that by the calling up to the colors the production was reduced to about 50 per cent of its normal proportions. The greatest part of this consists of supplies for the army. The not unimportant remainder is only kept going to avoid having to dismiss the rest of the workers. This means accumulating great stocks under the most unfavorable conditions. All the materials have risen considerably in price, especially cotton. "Our contracts for the cotton of the new crop are, owing to the impossibility of import (at that time) not carried out, and in order to keep going in the interests of the work-people we have to buy our supplies in Bremen out of the old crop, in so far as we can get the actual cash required, and at the very high prices demanded."

As regards Austria, the results of an inquiry instituted by the Cotton Spinners' Association of England, shows that at 79 manufacturing concerns the reduction of working time was 41.5 per cent and the shrinkage in the production of 55.3 per cent. The number of workpeople fell from 23,836 to 15,519, although only 1,270 had been called up for military service. The number of stoppages will soon be considerably increased by the lack of cotton.

EXPORT ON A CASH BASIS.

As noted in these columns at the beginning of the war, sentiment can have no connection with business and as the needs of the conflicting nations are made manifest, they must and will receive attention. Opportunities for export, some of them on a cash basis, are noted in both the advertising and reading pages of this issue. Underwear, hosiery, blankets, absorbent cotton, and many other lines are now required for foreign army supplies and export requirements. Many manufacturing plants in various lines and in many sections of the country are now operating day and night on orders of this character and only a beginning has been made. Textile manufacturers should carefully study these requirements and take immediate action as the time to take advantage of an opportunity is when it is knocking at the door.

A certain amount of cotton is being grown along the coast of British East Africa, but up to now no great progress has been made in this colony, except in the Kisumu district. The main interest in British East Africa is in the fact that it is the outlet for Uganda cotton.

The quality of the cotton produced in Uganda generally is satisfactory and is filling a distinct want, as it can be sold almost on arrival in England as a substitute for the better grades of Texas cotton at prices ranging from 50 to 120 points on middling Americans. There have been fewer complaints recently as to careless ginning and baling, but there is still a very large amount of stained and immature cotton.

National Association Convenes at Lenox

The fall convention of the National Association of Cotton Manufacturers at Lenox, Mass., was attended by over two hundred members and guests. More than a hundred of these went by special train from Boston, while others preferred to go by automobile.

An innovation adopted for the first time at this convention was the reading of the formal papers in abstract, thus allowing more time for actual discussion by the members. This is the plan used by some other technical bodies and has been found to increase the interest and value of the papers presented.

The social side of this fall meeting was again stressed by the association officials and the number of ladies indicated the general appreciation of these efforts

The Program.

The opening session was called to order Tuesday evening, September 29th, at 8:30 o'clock with President Albert Greene Duncan presiding. The records of the last meeting were read. President Duncan delivered his annual address which will be found immediately following the program outline. It was a masterly presentation of present manufacturing and business conditions and received much favorable comment from those who listened to its delivery.

Immediately following the president's address Charles T. Plunket, president of the Greylock Mills, gave an illustrated talk on "Cotton Textile Commerce with South America."

Albert Farwell Bemis, of the Bemis Brothers Bag Co., also gave an illustrated talk entitled "Textiles on the Hooghly." This speaker described the manufacture of jute and cotton in India.

At the conclusion of Mr. Bemis' address an informal reception was held by President Duncan and the official guests of the association, followed by dancing in the hotel ball-room.

At the Wednesday morning session, which was the one allotted for the formal presentation of papers, President Duncan explained that each speaker would be given five minutes to present a synopsis of his paper after which the subject would be open for general discussion. That this method of handling the technical papers was appreciated by the members was evident from the interest manifested. Papers presented were as follows: "The Production and Preparation of Raw Cotton for the Spinner," by A. M. Allen; "Weft Yarn Inspection," by Frederick H. Bishop, General Manager Universal Winding Company; "Beam Dyeing," by John Brandwood, Bury England; "Provisions for the Health of Employees," by William Hall Coon, M. D.; "Sources of Power," by Francis W. Dean, Boston; "The Effect of Structure on the Strength and Wearing Qualities of Cloth," by William Myers, Acresfield, Gatley, Cheshire, England; "The World's Demand for Cotton and India's Part in Meeting It," by Arno Schmidt, Manchester, England; "The Value of Trademarks in Cotton Textiles," by Henry C. Thompson; "Cost of the Permanent Fireproofing of Cotton Goods," by J. E. Tod, Manchester, England; "Time Temperature Distributions in a Bale of Cotton," by United States Bureau of Standards, Washington, D. C.: Importance of the Pink Boll Worm," by W. D. Hunter, Washington, D. C.; Secretary's Report on the "Proposed Restrictions Upon the Importation of Egyptian Cotton on Account of the Pink Boll Worm," by C. J. H. Woodbury.

James F. Reynolds, Washington representative of the Textile Bureau, was called upon to outline what had been accomplished by this new Washington office. No formal report was rendered but Mr. Reynolds outlined what had been done so far in an interesting manner. No request for a subsequent meeting for Thursday morning being made the convention was adjourned so far as formal meetings were concerned.

At the banquet on Wednesday night, President Duncan acted as toastmaster and stressed the need for cooperation. The speakers of the evening were Hon. W. P. G. Harding, of the Federal Reserve Board, Washington, D. C., who spoke upon cotton as a national asset; and Arthur R. Marsh, Esq., Editor of the Market World and Chronicle, and Ex-President of the New York Cotton Exchange who spoke upon the Lever cotton law.

President's Address.

Why are we as a nation the innocent sufferers from a quarrel not of our own making, and in which we have the strongest determination not to be involved! The causes lie deep in the structure of our country's life and history.

Every nation in its progress from savagery to civilization passes through three well defined stages of progress. The first may be called natural development, in which men are engaged in fishing, fur trading, the breeding of animals, agriculture and mining. The second may be called industry, in which the raw materials of the mines, farms and forests are combined for the uses of civilization. During this period men gather themselves together in thickly settled communities, bank credits replace barter and means of transportation for raw materials and finished products are devised. The third and highest stage in national life is that of commerce, when having developed its natural resources, perfected its transportation systems and solidified its credit a nation seeks to specialize in those products which its climate, resources and national character are best fitted to produce, and send these products broadcast throughout the world.

The countries of Europe had passed through the first stage of natural development long before this nation was established and during our early years they expanded their industries far beyond their own needs, and world-wide commerce has come to them in natural sequence. Their congested populations and highly developed industries have forced the older nations of the world to seek strenuously an outlet through commerce and colonization, and so their means of foreign transportation have grown, and their trade routes have girdled the globe. Controlling the routes of trade, they have become not only the carriers of their own goods but the distributors of the merchandise of others, and handling the distribution, they have managed the financing, through which the exchanges of merchandise are made.

This logical and inevitable development has built up in England, Holland, France and Germany a concentration

of capital devoted not alone to their own needs, but to the financing and distributing of the products of their competitors. They are not merely producers but the great middlemen of the world, and this commercial expansion has resulted in cumulative profits to those nations engaged therein. An idea of the immensity of this business is shown by the fact that at the outbreak of hostilities London bankers had outstanding advances of over $2,000,000,000 for drafts of sellers of merchandise of other countries.

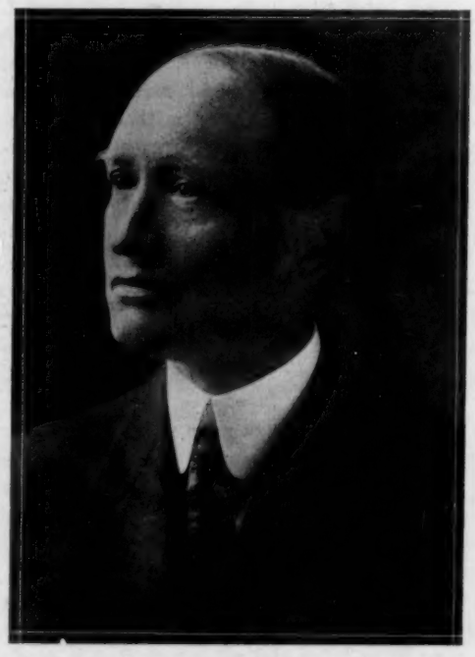
Commerce invariably brings with it a concentration of capital, as international exchange follows the trade routes of the world, leaving its toll with the nation through whose hand it passes. The great commercial nations have thus become the great banker and creditor nations, loaning their capital not only for moving the products, but for developing the resources of the countries with whom they trade.

In natural development and industry this country stands pre-eminent. Its progress has been the wonder of all nations. In increase in population, in railway mileage and by all the standards that material prosperity are judged we are leaders. In actual total wealth we rank first. We possess $137.00 per capita, but so great has been the task before us in our comparatively short national existence that agriculture and industry have been fully taxed to keep pace with our expanding population. Intent on our internal progress we have never taken the position as a commercial nation to which our resources, energy and skill entitle us.

This is but a hasty summary of the progressive development of nations at peace, but a war, the extent or the consequence of which none of us have ever dreamed, has plunged the world in disorder. Driven by necessity to use every resource in their own dire extremity, the warring nations have called and withheld the capital hitherto freely loaned to the peoples of Asia and the Western Hemisphere, and by the withdrawing of this capital they have not only made their debtors feel the pinch of want, but have been unable any longer to facilitate the necessary distribution of the products of nations not involved in the struggle.

To put the matters more concretely, the business of the world has been done on the basis of credit through the medium of the 90 day draft on London; probably not 5 per cent. of the transactions between nations ever being settled by the actual transfer of that universal standard of value,—gold. With this suspension of credit the world finds itself forced to a cash basis, and though we may wish as a nation to dispose of our products, which are in universal demand, and are eager to buy from other nations the materials on which our industries depend, we are reduced very nearly to the old system of barter prevailing in uncivilized times. It is estimated that England during the last few years has annually invested among the nations of the world about $1,000,000,000 of her surplus capital, and now holds over $5,000,000,000 of American securities. We have paid the interest on this vast sum and have met partial calls for this loan from time to time by the shipments of grain, cotton and other commodities, yet we are still very much their debtor. Figures are inadequate to picture the amount of this indebtedness, for it is a sum far beyond the power of this country or any other country to pay on demand. This is said with no disparagement of our prosperity. In per capita wealth and in boundless natural development we have congratulated ourselves for many years that we were one of the richest nations in the world, but our assets are not liquid. They are tied up in railroads, mines, mills, and in all the multitude of our business enterprises, which although real wealth, are not readily convertible. England, France, Holland and in a lesser degree Germany, have in addition to these fixed assets, accumulated as the result of their longer national life and highly developed world commerce, a much larger surplus of quick assets than we can possibly claim, and in the time of calling of loans it is with nations, as with men, that conversion of fixed assets is a slow process, often accompanied by great shrinkage of capital.

Because of the optimism that is characteristic of the American temperament we have heard a great deal in the last few weeks about the development of our export trade. Follow this for a moment and see where it leads us.



PRESIDENT ALBERT GREENE DUNCAN.

South America is our nearest neighbor, and trade routes thereto are naturally the least liable to interruption by any of the warring nations. Further we would seem to be in the comfortable position of a salesman who, through disaster, had lost his chief competitor. Without any spirit of pessimism it behooves us, however, to face the situation squarely and we find that South America is deeply in debt to the old world, that almost all their government loans are owned in Europe, that most of their railroads and industries are financed and even operated by foreigners. The nations to the south of us are in an earlier period of national life than our own country and have not far advanced beyond the stage of natural development, with industries as yet nowise ample to their needs. Our southern neighbors have been the largest users of foreign credit on which they have been almost entirely dependent. These advances have taken the form not only of actual investments of capital in their enterprises, but in the granting of long credits to merchants and in the financing of all the complicated transactions between producer, dealer and consumer. As a result of this financial relation, the trade routes to

them and international exchange have been in the hands of our competitors, and we as a nation have been obliged to depend upon our rivals for the distribution and financing of what small amount of trade we have secured from South America.

Are we prepared at the moment with all the problems, which we face in upholding our own complicated structure of credit, to assume the added burden of the financing necessary to relieve our South American neighbors from the desperate situation in which they find themselves? Means are ready at hand to facilitate this financing by exchange through New York rather than through London, but if we expect to do more now or in the next few years than to sell emergency goods we must be prepared to assume the additional burden of financing the trade and assisting the enterprises from which European nations may be forced to withdraw.

I have gone into this discussion of international trade in some detail, for the problem which confronts us at home and abroad appears to be largely a financial one, affecting not only our international relations, but the relations between producer, manufacturer and consumer in our own country. By the use of the easiest methods we have lulled ourselves into fancied security, and turned over to foreign nations five-eighths of our cotton crop, 15 per cent. of our wheat, 60 per cent. of our copper production, besides numberless other commodities, both raw and in the finished state. We have received in exchange for these an influx of gold or its equivalent, congratulating ourselves meanwhile that the balance of trade was in our favor, yet not realizing that we were leaving to our competitors in the world market the banking facilities and the distribution of our own products.

It is time for us to take account of stock and to realize that to produce our raw materials, to manufacture them into finished goods and to be satisfied to sell them merely to our people or to the foreigner at our ports is a mistake. We should take this opportunity which has brought such a rude awakening, to seize by every means within our power upon the avenues of distribution represented by the great trade routes of the world, where the fleets of foreign merchantmen go to and fro and where our flag is rarely seen. As a natural sequence of such foreign commerce we shall secure for ourselves the added reward that the financing of of the raw materials and manufactured goods exchanged with other countries must bring us.

After years of efforts the beginnings have been made in the foundation of an international exchange financed by our own banks, but we should not be satisfied until our manufactured products as well as our raw materials are carried to our customers and even to our competitors in our own ships. By no artificial means can our merchant marine be revived. It is not sufficient for us to own ships, we must be able to operate them under the American flag along the trade routes to the ports where we wish our products to go, and to do this we must devise wise measures by which the operation of such ships can be profitable. Our present antiquated navigation laws impose a burden on the operation of ships under the American flag that will not be relieved by any subterfuge of American registration. In other words, unless we make shipping as profitable as other lines of endeavor we cannot expect American capital to embark upon it. Recent proposed legislation, it may be noted, has not been drafted in favor of ship owners, but will tend to increase rather than diminish the handicap under which they now labor.

How can we convert our national wealth into quick assets? For if, as has been said, the trade follows the flag, how much truer it is that trade follows the man with the money bag.

We can stop our national tendency toward waste and extravagance, not alone in the individual, but in our governmental activities. Coincident with the high cost of living has come the higher cost of government, and to a marked degree, for figures show that in the last twelve years the average citizen pays 63 per cent. more taxes without commensurate benefit for such payment. We also have the multiplication of commissions, the endless waste which a political system based on patronage entails, the unnecessary expenditure of the nation's wealth in buildings and improvements which satisfy our national pride rather than enhance our national wealth and stability.

We must also by every means in our power stop the nation-wide distrust of corporate aggregations of capital. In the last few years most of the legislation having to do with business has been passed with the intent to punish rather than preserve, to tear down rather than to build up. It has been strangulation rather than regulation.

Capital is not the investment of the millionaire; it is the concentrated savings of the millions. Our great corporations are not owned by a few, but are the industrial savings banks of the nation, and it is no exaggeration to say than a majority of men managing our corporations, both large and small, regard themselves as trustees for the savings of their fellows.

While no doubt evils have crept into our business life, there is no justification for the unproved and sensational attacks which have been directed against capital, without any thought of the injury inflicted on the multitude of small contributors to the great aggregation.

The occurrences of the last two months have brought home to us as never before the power and the benefit to every citizen in the republic, no matter how humble, of capital when rightly used, and to the glory of American business be it said that in the trying times through which we are passing capital has borne the full brunt of the emergency, realizing that it was only by its free use that the complicated structure of our industrial and commercial life could be kept secure.

If there existed a money trust in this country, cruel, grasping, and seeking its own selfish ends, as has been so vehemently charged, the last sixty days would have seen one-half of our enterprises in the hands of receivers or being bought up at bargain prices.

But how different the action of so-called concentrated financial power. With the true spirit of cooperation, instead of causing wrecks they have furnished pilots and lighthouses, and instead of the destruction of commercial enterprise it has been maintained and preserved in spite of the interposition of strange and unanticipated issues.

The history of the last few years of national and state legislation has witnessed a development of commissions never before dreamed of in any country under a republican form of government. These commissions have organized for every conceivable purpose, but mainly their energies have been devoted to the regulation and investigation of so-called existing evils in our commercial structure, rather than to the development of our admittedly adequate

resources along lines not hitherto undertaken. How much wiser it would be if the commissions should be empowered to study the whole subject of the encouragement of the American trade and recommend to Congress what legislation is needed to enlarge our surplus of quick assets, free our capital from harassment and restriction and expand our foreign trade by enabling American shipping to take its place on the high seas as the messenger of our already firmly established industries. International exchange with its inevitable profit would then be in our hands, and no artificial stimulation would be needed to establish in this counry the financial capital of the Western Hemisphere. The periods of industrial depression through which we have passed would thus be obviated by extending our influence over the world, instead of fighting each other for our own market, so often overstocked. I believe that many of the business evils so bitterly complained of may be traced to the source of excessive competition and would then surely right themselves without government regulation.

What I have hitherto said applies to our industries in general, but to cotton manufacturing most of all. The spinning and weaving of cotton cloth was the first industry in America to leave the home for the factory. From small beginnings it has built up an invested capital of at least $843,000,000. It is still, as it always has been, highly individualistic. It is one of the few industries against which no charges of illegal combination or any of the other wrongs so bitterly complained of have ever been made. It is the one industry adapted to supply the needs of all nations of the world, whether civilized or uncivilized. To anyone familiar with the over production which has been in evidence during the last decade it is patent that we can more than supply the wants of our own people. We are, therefore, the industry most dependent on the development of our own country as a shipping and financing nation. To use a homely expression: In what export trade we have so far done we find ourselves in the position of a storekeeper who uses his competitor's banking facilities and delivery wagons. If the cotton industry is to be prosperous and give steady employment to its vast number of operatives and a fair return to its investors, we must use every effort to get and keep the financing and distributing of our products to the nations of the world out of the hands of our competitors; for there is no question that with these facilities in hostile hands we are constantly being put in a position where competition is impossible.

I would urge upon you, gentlemen, members of our Association, to give atention to these financial problems and bring them before your representatives in state and nation in no uncertain terms. For the people of the United States must learn a lesson from the present crisis and make it their chief concern that America shall in the future control the financing and distributing of its own products.

In the upbuilding of the Japanese cotton industry the mills have been greatly hampered by lack of money and experience, as well as by the lack of skilled operatives and the difficulty, under their system of transient girl operatives, of creating and maintaining a trained force. The first cost of the mills is so great that, with high interest charges and high taxes, which have been greatly increased since the Russian war, the manufacturers have resisted all attempts by the authorities to enact regulations that would interfere with night work.

COTTON CONSERVATION AS AN ASSET.

BY HON. W. P. G. HARDING*.

The cotton industry is perhaps as seriously affected by the European war as any other, and this statement applies with equal force to all concerned with it,—the producers of raw cotton, the manufacturers and the distributors of cotton goods. The opportunity for expansion of our textile trade which is anticipated as an aftermath of the war, while undoubtedly a potentiality, does not as yet appear to exist to any appreciable degree. The titanic struggle between the great powers of Europe has disarranged credits, and has disturbed the exchange of commodities throughout the world; and while cotton is classed as a staple crop, and goods manufactured from it are necessities, they are not as supremely and immediately necessary as foodstuffs. Because of this fact the first effect of a great war is to advance the price of grain and to depress that of cotton. Yet the economic law of supply and demand, while apparently suspended at times, is never abrogated and always in the end reasserts itself. When a dam or other obstruction is thrown across a stream the flow below it is reduced until the water impounded flows over the top, when the normal volume is restored; and if the obstruction be removed the flow becomes abnormally large. At the present juncture, the war is operating as an obstruction to the normal current of the cotton trade. Sooner or later, however, even should the war continue, the level of the obstruction will be reached and the flow of business, except in some of the countries actually engaged in war, will again become normal. A restoration of peace would release a large volume of business, so we are justified in taking a more cheerful view of conditions.

Cotton goods are the cheapest of all textiles and should replace during hard times finer and more expensive fabrics. Cotton can be used in considerable quantities as a substitute for jute and other materials in the manufacture of burlaps and sacks; mills in England are reported as running double time on khaki for army uniforms and there is no reason to doubt that the trade will ultimately absorb the world's production. Cotton manufacturers must solve the problems which have grown out of the closing of the cotton exchanges of this country, whereby they have been deprived of a standardized price and of their power to hedge on contracts, and must overcome the further difficulty, occasioned by loss of confidence and curtailment of credits, of financing purchases. Compared with the prices that have obtained for the past three or four seasons, present quotations seem very low, but it is doubtful if large stocks of cotton could be secured at prevailing prices, as an active buying movement would undoubtedly enhance values. It is argued that the southern states have produced a cotton crop, which added to that grown in other countries, is under present conditions about 5,000,000 bales greater than is required for the world's needs; and the fear that this is true is causing much apprehension.

There is in every normal year a certain proportion of the crop which comes in early and which seeks the market at any level that it can find, which is commonly called "distressed cotton." This is the cotton that is now being

*Extracts from an address delivered before The National Association of Cotton Manufacturers.

sold 7½ to 8 cents, and it would be well for manufacturers to bear in mind that at these figures much cotton will be withheld from the market for months to come. For many years the South has been gaining in wealth and its farmers growing more independent. It is true that there is a great amount of indebtedness which can be liquidated only by the sale of cotton, but in view of the increased cost of production in recent years, sales at present prices would be in many cases inadequate for the discharge of these obligations, so that even if the producer, being unable to sell his cotton for enough to pay his indebtedness, should turn it over to his creditor, many of these creditors would be in a position to hold, and much of the cotton will be withheld from the actual market.

The financing of the present crop began with its planting last March and April. The last four crops, including seed, have brought the people of the southern states a gross average of nearly one thousand million dollars per year, of which amount about one-half has come from domestic and Canadian mills, and the remaining represents the value of exports to foreign countries. By the sale of this crop the South has been enabled not only to discharge its obligations promptly every fall, but has added half a billion dollars each year to the national trade balance. Cotton production is stimulated by high prices, and conversely it is curtailed when prices fall below the cost of production. Never have the evils of over-production been so universally appreciated in the South as now, nor ever before has there been such grim determination to hold cotton and to radically curtail acreage. Public sentiment in many southern states has been so aroused that there is now a general clamor for legislation by the states to regulate the production of cotton, and some farmers have gone so far as to demand that the planting of any cotton whatever in 1915 be prohibited. Of course, extreme action of this kind is not anticipated, but it is undoubtedly true that should prices considerably below the average cost of production prevail for the next six months, cotton will be parted with only as necessity arises, and most serious curtailment in acreage for the next crop will be the inevitable sequence. Many of those who might be financially able to put their lands in cotton would be attracted by the high prices for grain and would plant food crops, while others less independent might be willing to continue in cotton, but would find themselves unable to secure the necessary advances.

No man well informed on southern conditions will deny that further diversification in southern farming is desirable, and that more attention should be paid to cattle raising and to the production of foodstuffs. But it would be most unfortunate if, by any chance, the production of cotton next year should be so small as to make the trade dependent on the present crop for the greater portion of two years' supply. Cotton goods can compete with more expensive fabrics only up to a certain price level, and if a year hence the prevailing prices for raw cotton should be as abnormally high as they are now abnormally low, the manufacturers of cotton goods would have their present problems aggravated, and would be fatally handicapped in a movement for trade expansion at the very time when it is probable that conditions would be ripe for efforts in that direction. I shall not undertake in the presence of the foremost experts to hazard any guesses as to the probable consumption of cotton within the next few months, but I will be bold enough to predict that as the season progresses there will be a steadily increasing demand for raw cotton by the mills, with a marked increase in the demand for export.

Foreign exchange conditions have within the last few days been vastly improved by the formation of the gold fund as approved by the Secretary of the Treasury and the Federal Reserve Board, and as our exports of grain and cotton increase in volume, as they must do in the very near future, normal quotations for sterling bills will again prevail. I am violating no confidence when I state that rapid progress is now being made in the organization of the Federal Reserve Banks, and it is my personal opinion that the system will become effective during the coming month. The Secretary of the Treasury has acted with wonderful celerity throughout the crisis, and by his promptness in authorizing and issuing emergency currency under the provisions of the Aldrich-Vreeland Act as amended, has, in the face of moratoria in nearly all other civilized countries, kept the United States not only upon a cash basis, but upon a gold basis, and he asks only the intelligent and unselfish cooperation of the business community, which he confidently expects, to aid him in the speedy restoration of normal financial and commercial conditions throughout this country. The tremendous waste incident to war, will, of course, be felt all over the world, and losses will inevitably ensue, but there is no reason, as far as this country is concerned, why those losses should not be so uniformly distributed that they will not fall with crushing force upon any section, or upon any industry; and I firmly believe that American pluck and American energy are going to reassert themselves, and that American farmers, merchants, bankers and manufacturers will cooperate with their government, and with each other, in solving present problems, and that they will put themselves in a position to grasp the opportunities that the future is bound to offer.

The Federal Horticultural Board at Washington has issued a notice to all cotton mills, and especially those in the South, to destroy, by burning, all seed that may be found in bales of imported Egyptian cotton. These seeds are likely to contain the larvae of the pink boll worm, which is very destructive to American cotton. The number of seeds of Egyptian cotton found in a bale of Egyptian lint is probably small, and the presence of any seed in such bales is due to faulty ginning. Ginning and storing, however, does not kill the larvae of the pink boll worm, which has been known to withstand storage in cottonseed for more than seven months.

So dangerous to the cotton crop of the United States is the pink boll worm regarded that on May 28, 1913, a quarantine was promulgated, designed to prevent the introduction into the United States of this worm by forbidding the importation of cottonseed from all foreign countries excepting two regions in Mexico. Since that date several shipments of cottonseed infested by this worm have been intercepted and destroyed.

The Horticultural Board has begun an investigation to determine the amount of infestation by the pink boll worm in the seed thus introduced. An agent will visit the northern and southern mills for this purpose. The elimination of the danger by improved methods of ginning, or possibly by further quarantine regulations will have early consideration.

The Situation in Latin America*

BY HON. JOHN BARRETT†.

There are two reasons why, in spite of the overwhelming pressure of work in Washington and the demands of other engagements upon me, I have come down into the heart of the South to make this address. The first is that I am a profound believer in the future of this section and in the possibilities of its exchange of commerce with the twenty Latin American countries reaching from Cuba and Mexico south to Argentina and Chile. The second is that although I was born and raised in New England, I developed in my youth a love for the South through having not only visited all parts of it as a young man but also took a course of study at Vanderbilt University, Nashville, Tennesse, where I came in close contact with young men from every southern state.

In my early diplomatic experience, when I was a United States Minister in Asia; in later times during my experience as United States Minister in South America, and in recent years as the executive officer of the Pan American Union, I have always tried to keep the southern states of the United States thoroughly posted as to every commercial possibility in the sections where I was representing the country. If many of the commercial organizations from Virginia to Texas will consult their files they will find numerous communications from me going back for nearly twenty years!

HON. JOHN BARRETT.

While, if I had time, it would please me to discuss the commercial opportunities of the South in all parts of the world, I shall confine my remarks on this occasion to our sister American republics. This is a field of such extraordinary importance at the present moment that it is worthy of our closest study and investigation. For long years the Pan American Union, the international organization of all the American republics maintained in Washington for the development of commerce, friendship and peace among the American nations, has been striving to educate the American people to the progress and possibilities of Central and South America. It has labored incessantly in this propaganda, but it has remained for a cruel war in Europe to suddenly turn the spot-light with special brilliance upon the countries and the markets lying to the south of us.

At the outset, I want to strike a strong note of warning and caution. While there is undoubtedly a mighty potential opportunity for United States commerce in Latin America under normal conditions and when money is plenty, there is at present unavoidable financial stringency and disruption of trade machinery in nearly all of the southern republics, caused by the war, which must be borne in mind by all firms and persons entering the field. Although Latin America's trade amounts annually to many billions of dollars this stringency has developed a critical condition which prevents it from now purchasing as heavily from the United States as it otherwise would. What the commerce of Latin America really needs at this moment is not so much our manufactured products and our ships, although these are required to a considerable degree, but rather active financial help in the form of necessary money advances, reasonable credits, and a market for their raw products which usually go to Europe.

I would further caution you not to be misled by the glowing and colored accounts of the wonderful opportunities in Latin America which do not also emphasize the present economic conditions. There is a great opportunity in Latin America for the manufacturers and exporters of the United States, but at the present moment it may be more an opportunity to study, investigate and master the conditions of the field rather than to conduct large sales. It is an opportunity to prepare for normal conditions and to get a trade in which Europe has heretofore had so large a share.

Having now impressed firmly on you this warning and caution, I will give you some interesting facts that prove the actual value of the Latin American commercial opportunity. These twenty countries which, with the United States, form the constituency of the Pan American Union, cover a combined area of 9,000,000 square miles, which is three times the connected area of the United States. Think what this means for material, economic, industrial and agricultural development. The greater part of that area is in about that condition of material exploitation which characterized the southern and western sections of the United States thirty years ago.

Bearing in mind that population is an important element, we note that these twenty countries have a combined population of 75,000,000, with a high purchasing capacity

*Extracts from an address before the Georgia Manufacturers' Association.

†Director General of the Pan American Union, Washington, D. C., and formerly United States Minister to Argentina, Panama, and Colombia.

when economic conditions permit. This population, moreover, is increasing more rapidly by reproduction than is the population of the United States.

Commerce is often described as the life-blood of a nation. If this is true these twenty countries, despite the alleged revolutions and instabilities of a few of them, are certainly lusty and full-blooded. Last year they bought imports and sold exports to the foreign world valued at the vast total of $3,000,000,000 and this in turn represents an increase of nearly $1,000,000,000 during the last decade! No matter, therefore, what criticisms may be made of this field these simple facts tell the story of its inherent worth. When we analyze these figures we find that approximately $2,000,000,000 of Latin American exports and imports were comprehended in the trade with Europe and largely with countries which are now at war. Naturally, then, they must buy in greater quantities from the United States and sell to it in larger amounts, provided, of course, they have the money with which to conduct the transactions. If the manufacturers and exporters of this country, will, therefore, in this crisis extend to the Latin American purchasers reasonable credits and give them the most favorable terms possible, they will be inclined to buy here what they were ordinarily buying in Europe and then, when the war in Europe is over, continue their business with the United States. They, however, have a great accumulation of raw products which they must sell in order that they may have money with which to buy. As heretofore a large proportion of these raw products have gone to Europe, the importers of the United States should endeavor to provide a market here for them and, therefore, help the business men of Latin America to establish a credit here.

A most practical evidence of the value of this field to the United States is the fact that this country has built up its Latin American trade in the last ten years nearly 100 per cent, or, from $450,000,000 to nearly $850,000,000. These figures comprehend both exports and imports.

A most important step has just been taken which will be of great advantage to all American manufacturers, exporters and importers wishing to do business with Latin America. This is the establishment in Rio de Janeiro, and in Beunos Aires and in other cities, of branches of the National City Bank of New York City. These branches cannot fail to be a great help in conducting commercial transactions. Every effort, moreover, is now being made to improve the steamship facilities between the principal ports of the Gulf and Atlantic coast of the United States and those of Latin America. Bills which are now before Congress, if passed, will facilitate the establishment of lines from those particular ports of the Gulf and south-eastern United States with which your trade is closely associated.

The most practical step that can possibly be taken by any commercial organization, groups of business firms, or individual firms, is to send competent men throughout Latin America to study the markets with reference to your capacity to supply and the actual conditions of demand. All the correspondence that you may carry on with agents and bureaus of information will not begin to give you the valuable data which you can obtain from competent representatives who are actually in the field. It would be far better to spend several thousand dolllars in getting this accurate view point and learning even that the field contained little to tempt you, rather than to spend five times as much through second-hand sources and ascertain the truth finally through bitter experience.

It is of importance, moreover, to keep in close touch with such official organizations as the Bureau of Foreign and Domestic Commerce and the Pan American Union, at Washington, and such unofficial organizations as the Southern Commercial Congress and the United States Chamber of Commerce, in Washington, and the National Foreign Trade Council in New York City. All of these are only too glad to supply any information that may be in their power. The steps already taken and the agencies established, for instance, in Atlanta by the Department of Commerce, and by some of the southern railways in Chattanooga, cannot fail to be productive of splendid results.

The manufacturer who wants to do business in Latin America should always bear in mind its credit system. this is, however, much exaggerated and is not by any means as dangerous as often portrayed. The majority of Latin American buyers are just as sure pay as the corresponding class of men in the United States, even though they may require a little more time. Another point to be borne in mind is the necessity of supplying what the Latin Americans want instead of trying to make them accept only what the United States manufacturers choose to produce. If catalogs or circulars are used the greatest caution must be exercised to have them printed in correct Spanish, for when done poorly they become the butt of jokes rather than useful data for the promotion of trade.

There is a great deal of discussion about the improvement of shipping conditions between the United States and the principal ports of Latin America, but the difficulties of the situation are exaggerated. At the present moment there are many vessels offering to take the exports of the United States to Latin America and to bring back what they have to sell. There has been extraordinary improvement recently in the the shipping communication between the United States and all the ports of the Gulf of Mexico and the Caribbean Sea. There has also been much improvement in the lines between such ports as New York, and those of Rio de Janeiro and Beunos Aires. Perhaps the greatest opportunity for improvement is through the Panama Canal and on the west coast of South America.

I will now point out to you three important sub-divisions of the Latin American trade opportunity which should be borne in mind in all your efforts to enter that field.

The first division includes the Latin American countries bordering upon the Gulf of Mexico and the Caribbean Sea, of which there are eleven. These ports are all very accessible to the Gulf and south-eastern Atlantic ports of the United States. In the general study of Latin America too much prominence is given purely to the South American section proper and not sufficient consideration of this Gulf and Caribbean field. The importance of the latter is shown by the fact that the foreign trade of the coast line of the Gulf and Caribbean last year amounted to nearly $700,000,000, and this is sure to grow in the near future to a $1,000,000,000, in which the southern states ought to have the largest share. In looking at the Panama Canal we must consider the countries on the way to the Canal as well as those beyond it. The Canal is in a sense a great water bridge between the Atlantic and the Pacific, and the bridge builds up the countries approaching the bridge as well as the countries beyond.

Having noted the field on the way to the Canal and close to us, let us now look at the field beyond the Canal which is making good progress although handicapped at the present time by the conditions which have heretofore obtained from its isolation. Twelve Latin American countries have a coast line which reaches for 8,000 miles from the Mexican-California line southeast to the Straits of Magellan. This coast line without the use of the Canal last year conducted a foreign trade in excess of $600,000,000. Now that the Canal is in operation this trade should soon pass the $1,000,000,000 mark, and, in this, the southern states should have a large share provided they will go after it with the same energy they go after trade within the borders of the United States. The west coast has been somewhat backward in its development heretofore, but it has the same capacity for progress that characterized the Pacific Coast of the United States following the construction of the trans-continental railroads and the coming in of population and capital.

The third sub-division of Latin America is that of the great countries bordering on the south-eastern Atlantic, such as Brazil and Argentina. These two, together with Uruguay and Paraguay, conduct an annual commerce in excess of $1,600,000,000, and they have shown a progress which has astonished the world. Into Brazil could be put the entire connected area of the United States with room left over for Georgia and Tennessee. Out of the Amazon river flows five times the volume of the Mississippi, and its valley contains 20,000 miles of navigable streams. Rio de Janeiro, Brazil's capital, has a population in excess of 1,000,000, and the whole country has passed the 20,000,000 mark.

Argentina today is receiving as much attention as any South American country and that attention is well deserved, for last year it conducted the largest foreign trade per capita of any important country on the face of the earth, and with 10,000,000 people bought and sold more in commerce with the foreign world than did Japan with 50,000,000 or China with 300,000,000 people. Beunos Aires, its capital city, has a population of 1,700,000 and now ranks as the third city of the western hemisphere, coming after Chicago and New York, as the second Latin city in the world, ranking after Paris; and as the first city south of the Equator.

Practically all of Argentina and Chile, all of Uruguay, and portions of southern Brazil and Paraguay, are in the south temperate zone, with the same variety of climate which characterizes the United States.

If what I have said here tonight excites the interest of any who want to know more I hope they will get into communication with the Pan American Union, or with the Bureau of Foreign and Domestic Commerce of the Department of Commerce, the Southern Commercial Congress, and the United States Chamber of Commerce, all in Washington.

A large part of your insurance survey and rate is always based on deficiencies in the physical construction of your property. Study this (such as unprotected vertical and horizontal openings, too large areas undivided by fire walls, concealed spaces, etc.), and ascertain how they may be reasonably remedied, and how such improvements will reduce your insurance rate.

GEORGIA MANUFACTURERS ORGANIZE.

The manufacturers of Georgia held a two-day convention at Macon on September 24 and 25. At the close of the second day's work a temporary organization was perfected with the following officers: Ab Dean, of Rome, president; W. P. Stevens, of Macon, vice-president; G. G. Toole, Macon, secretary, and R. J. Taylor, Macon, treasurer.

A permanent organization committee of prominent manufacturers of Georgia was named. This committee will meet in Atlanta within a few weeks and perfect plans, constitution, by-laws, etc., and then call another meeting of the manufacturers of the state. The organization committee named was as follows: Fred B. Gordon, Columbus; Oscar Elsas, Atlanta; H. B. Meikleham, Lindale; T. I. Raworth, Augusta; Thos. K. Glenn, Atlanta; William Kohoe, Savannas; Geo. Lombard, Augusta; Thos. McMillan, Savannah; O. P. Willingham, Jr., Macon; H. H. Tift, Sr., Tifton; Julius Gresham, Griffin; S. L. Dickey, Atlanta, and a representative from each of the following concerns to be named later: Towers & Sullivan Company, Rome; Columbus Buggy Company, Columbus, and R. D. Cole Manufacturing Company, Newnan.

The organization committee will go actively to work to enlist the co-operation of every manufacturer in Georgia and when the next meeting is called the attendance is expected to be very large.

The Macon meeting was enthusiastic from the first session. Every number on the splendid program was one of interest. The principal addresses were made by Hon. John Barrett, director general of the Pan-American Union, Washington, D. C., C. L. Chandler, South American Agent of the Southern Railway; W. A. Graham Clark, United States Department of Commerce, with offices in Atlanta; S. L. Dickey, southern sales manager of the Dodge Manufacturing Company, and a number of others.

A resolution was adopted authorizing C. L. Chandler, of Chattanooga, and Judge Miller, of Macon, to draft a resolution to be sent by a committee of Georgia manufacturers to congress calling upon that body to open negotiations for the unification of tariff laws in the twenty Latin-American countries to the south of us. The negotiations will probably be opened at the Pan-American conference. Senator Hoke Smith, Senator-Elect Hardwick and Secretary of State Bryan will be called upon to assist in the matter.

Senator Duncan U. Fletcher, President of The Southern Commercial Congress, recently announced the postponement of the sixth convention of the Congress from November 10-14 to April 26-30. The Congress is to be held in Muskogee, Oklahoma. Elaborate preparations had already been made for the fall convention and many of the most notable men not only of the United States, but from foreign countries, were to participate on the program. In view, however, of the European war the Executive Officers of the Congress and the Committee of One Hundred of Muskogee have decided to make the change. Senator Fletcher expressed the belief that the change, which would give additional months for preparation, would make the convention in the spring unprecedented in point of importance and attendance.

Establishing Trade With Latin America

BY C. L. CHANDLER*.

Southern manufacturers and merchants should lose no time in taking advantage of the opportunity which the war in Europe has given them for extending their trade with South American markets, particularly with Argentina and Uruguay, and ports in the Caribbean Sea.

These countries, which have been buying largely from Great Britain, Germany and France, must find a new source of supply and there is no reason why southern manufacturers should not obtain a large share of this trade, particularly of machinery and metal articles of all kinds, as well as cotton goods. The recent establishment of an American bank at Beunos Aires and Rio Janeiro will prove of great advantage.

As illustrating the extent of the markets that are awaiting enterprising American exporters in Argentina and Uruguay, the following facts in regard to the trade possibilities of these countries will be of interest:

ARGENTINA

Argentina is the third largest American republic, having an area of 1,139,979 square miles or equal to over ⅓ the total area of the United States of America. Its population is entirely composed of white people and in 1912 was officially estimated to be 7,704,936. As this is essentially an agricultural and pastoral country, with density of population of but 6.2 per square mile, it will be readily deduced that the majority of the people are engaged in these pursuits.

As Argentina takes 40 per cent. or nearly half of our exports to the South American Continent, she is by far our most important South American market, both present and prospective. Our exports to Argentina are five times what they were in 1902, and her total foreign trade today is 145 per cent. greater than in 1903. The Argentine railway mileage has doubled since 1902, while the exports of her agricultural and pastoral products have tripled.

The total foreign commerce of Argentina, in 1912, amounted to $839,387,383, of which $373,307,865 were imports and $465,979,518 exports. This is a per capita trade of $118, greater than any other country in the world, and furthermore, this is constantly expanding. In 1913, the total foreign commerce amounted to $904,857,089. While Argentina is the ninth largest customer of the United States (she is the sixth largest customer of Great Britain), there is no reason why this figure cannot be bettered. Great Britain and Germany lead in the imports of this republic, with a percentage of 30.8 and 16.6 respectively, the United States being third with 15.4 per cent., or just one-half that of Great Britain.

American goods are well received in this market, but the American manufacturer has not made a determined effort to take the business away from his English and German competitor, as by far the bulk of our exports have been in such competitive articles as agricultural implements, machinery, lumber, etc. Almost every product manufactured on the lines of the Southern Railway, Mobile & Ohio Railroad, Cincinnati, New Orleans & Texas Pacific Railway, and the Alabama Great Southern Railroad, can find a ready market in this country if our manufacturers go after the business in the proper way. They must be willing to meet and conform with the needs of the market, and create a demand for their respective products in the same manner pursued in the home field. Firms cannot expect the business to come to them without a thorough and systematic exploitation of this field. Patience, intelligence and persistency should be the watchwords.

As there are practically no factories in Argentina, clothing of all sorts, as well as shoes, etc., are greatly in demand. The imports under the heading of manufacturers of textiles amounted to $75,587,211 in 1912. Of this trade the United Kingdom monopolizes about half, the remaining half being competed for by Italy, Germany, France, Belgium, the United States, Spain, and other countries. Though subject to occasional setbacks, the purchases of foreign-made cottons show a strong upward tendency, and the prospects are that most of the cotton-goods requirements of Argentina will always be supplied by more favored lands. As previously stated, the resources of this country are entirely agricultural and pastoral; cotton cannot be raised as cheaply as in the United States; coal and machinery, as well as mill supplies in general, have to be imported; and there is no supply of cheap industrial labor on which to draw. The cost of living is so high that the few existing mills are hampered by the increasing demand for higher wages.

The principal reason for the comparatively small sales of American cotton goods in Argentina, which include scarcely anything beyond cotton bags, yarn and duck, seems to be that the import trade is controlled by a few big foreign houses, who have long-established connections with European firms, and who in many cases are practically exporters' agents and therefore not interested in American cottons except when they cannot obtain goods of the same quality as cheaply elsewhere. That this difficulty can be overcome is shown by the fact that Germany, Italy, and Spain succeeded in breaking into a market strongly held; and they did it in a large measure by establishing their own firms and founding their own banks in Argentina and by encouraging competing steamship lines under their own flags. The fact that there are such good connections today between Europe and the River Plate is due to the inauguration of fast Italian and German lines, which forced the English to follow in their footsteps.

While some of the importers are "tied" houses and cannot handle competing goods, there are some who are free to buy where they choose, and these state that few American cotton-goods exporters have made any serious effort to get in touch with them. They also give the customary stock objections heard in most places, that the American manufacturers and exporters will not make or put up and ship the goods as wanted by the importer; that they look down on small initial orders of a few cases of various kinds; that they leave the importer in the lurch as soon as the home market picks up, etc. They say that in any case they can get only a portion of what they require from the United States, as some of their principal requirements, such as T cloth made with colored head ends,

*South American Agent, Southern Railway, Chattanooga, Tenn.

medium-heavy starched white shirting and prints and split prints, can not be obtained from the United States. On some lines the American goods can not compete in price, in others they can, but they need first to be brought to the attention of the importer by traveling men with samples and quotations.

The Argentine tariff on cotton goods is a moderate one. With the large houses that do most of the importing, time is not much of a consideration, and many prefer to get a cash discount. Though it takes a little longer to get goods from the United States, the freight rate is much lower than from any part of Europe. There are fair chances of successful American competition if trade is sought in the right way, and the very fact that American cottons are usually regarded as "too strongly made to be cheap" will be in their favor if competitive prices are offered. The market is one well worth working for, as the demand for cotton goods is not only large and increasing but will be permanent, and there is small chance for any strong competition in the future from native mills.

Beunos Ayres, which is the eighth largest port in the entire world in total commerce, has direct shipping communications with Mobile, via the Munson Line boats, and although there are at present only from one to two sailings a month, more boats will be added to this service as soon as shippers realize the money they can make in the River Plate countries. Sailings take about 30 days, which, together with the time saved by rail to Mobile, is from three to five days quicker than from New York. Freight rates to Mobile are, in almost every instance, cheaper than those from same points to New York, which is an additional incentive why exporters should use this route to Beunos Ayres.

Firms now exporting or about to export to Argentina should understand that satisfactory results cannot be obtained by the mere sending of catalogs and advertising matter, although some business may result from this method. In order to reach the trade and meet the requirements of the market, proper representation is absolutely essential, either by having personal Spanish-speaking representatives in Beunos Ayres or desirable agencies located therein, either with an American or an Argentine firm. They should never be represented by Englishmen, Germans, or other aliens if it can possibly be avoided, as such houses in most cases are carrying a competing line of goods from their own country, and although they may accept an American agency, it is often for the purpose of stifling the American goods. Full information regarding the credit ratings in Argentina can be secured from Dun's Agency. If the prospective entrant into the Argentine field manufactures a line that can be sold by the department stores, he should get into direct touch with them, as in this manner he can get by far the best results. Much valuable time and money is wasted by sending printed matter to the South American countries which finds restful repose in the waste basket without ever having been carefully read or disseminated. Catalogues and price lists, as well as advertising matter sent to representatives in Beunos Ayres for distribution should be in Spanish, with the weights and measures in the metric system and the prices in Argentine currency. All correspondence should also be in Spanish. Full postage should always be paid on all mail matter sent to this country.

Remember that Argentina is by far our largest and most permanently extensive South American market. There is a market there for practically everything made in the United States.

Remember the alternating seasons, that it is summer in Argentina when winter here, etc., as this is very important for trade in all kinds of clothing and wearing apparel.

URUGUAY

The Republic of Uruguay has an area of nearly 73,000 square miles, being larger than the Netherlands, Denmark, Switzerland and Greece combined. There are 681 miles of its border line on navigable water. It has a temperate climate with a mean summer temperature of 73 degrees and a mean winter temperature of 50 degrees. Almost every part of its area is valuable for agriculture or stock raising. A country with these natural advantages and whose foreign trade has risen to $115,808,000 in 1913, is worthy of attention as one of the markets of the world.

During the year 1912, the Uruguayan imports amounted to $51,355,200 and exports to $53,040,000, making a total of $104,393,200. As the population of Uruguay is estimated at 1,279,000 people, 98 per cent. of whom are white, this gives a per capita foreign trade of $80, a figure equalled by very few of the commercial nations of the world. While China, with a population of over 400,000,000 has been receiving a great deal of attention by American capitalists, Uruguay has been almost entirely overlooked, yet the foreign trade of the United States with this republic is fully one-third as great as with China, and the average purchasing power of the Uruguayan, as far as we are concerned, is 600 times as great as that of the Chinaman. Great Britain and Germany, both of whom have studied thoroughly and exploited to a large extent the Uruguayan markets, lead in the exports to Uruguay, with the United States a poor third, having exported less than one-half as much as Great Britain.

This proves conclusively that it is only by making an exhaustive study of the customs of the people, proper representation, and willingness to meet and conform with the needs of the market, that we can hope to eventually usurp the position now held by Great Britain. American goods are needed in that field but the manufacturer must realize that as much care must be used in the exploitation of foreign fields as is exercised at home. United States exports to Uruguay have increased from $3,134,694 in the calendar year 1908, to $7,617,110 in the calendar year 1913. This is a greater proportional increase than to any other country in the world.

There are direct shipping facilities from Mobile to Montevideo, the capital and chief distributing center of Uruguay, via the Munson Line boats. Freight rates to Mobile can compete satisfactorily with those of foreign lines to New York, which is an additional incentive why exporters should use this route to Montevideo. Montevideo has nearly 400,000 inhabitants and is a thoroughly modern city in every respect. It has all the needs of a city of its size in the United States and must import most of them from abroad.

Uruguay has for many years maintained her credit upon a high plane and her proven integrity and punctuality in meeting her obligations are well known throughout the financial centers of the world. She has maintained a gold standard of currency for many years. An illustration of this stability and her diversity of trade may be gathered

from the fact that although during the past year many countries suffered and are still suffering from a heavy financial depression, Uruguay has prospered, and is steadily forging ahead. Many business men in the United States are still laboring under the delusion that revolutionary ideas are prevalent in Uruguay, and this hallucination should be quickly dispelled. The Uruguayan government employs ten American experts who are teaching the people to develop their natural resources.

Once again let me state that satisfactory results *cannot* be obtained by the mere sending of catalogues and advertising matter, although some business may result from this method. In order to reach the trade and meet the requirements of the market, proper representation is absolutely essential, either by having personal Spanish-speaking representatives in Montevideo, the distributing center for the entire Republic, or desirable agencies therein, either with an American or an Uruguayan firm.

A permanent exposition will be established in the Museum of Manufactures of the Uruguayan National School of Commerce, according to an announcement furnished by the Ministry of Foreign Affairs (a translated copy of which may be had from the Bureau of Foreign and Domestic Commerce, Washington, D. C.). The Ministry requests that the contents of this announcement be made known in the United States in order that manufacturers may have an opportunity to contribute to the exposition. The exposition will be free to exhibitors and will be an important factor in developing direct business by informing local merchants of the origin of the different articles, with data that will facilitate their purchase. It is hoped that many American manufacturers will take advantage of this opportunity to display samples. Correspondence should be addressed to the Ministerior de Instruction Publica, Montevideo, and the sample marked "Para el Museo Merciologico de la Escuela Nacional de Comercio."

Opportunity for increasing trade with many important ports on the Caribbean Sea has been given to southern manufacturers and merchants by the recent establishment of the Seeburg Line of service between Mobile and Venezuela and Colombian ports. Three new steamers, making fortnightly sailings from Mobile, have been placed in this service.

The trade of the United States with Colombia and Venezuela is increasing rapidly and many of the exports to these countries are manufactured in the South. The United States Vice Consul at Maracaibo, Venezuela, reports that the merchants of that city are making efforts to prepare themselves for increased business relations with the southern states of the United States resulting from the new service from Mobile and this same renewal of interest is doubtless taking place at other places where the Seeburg Line will stop.

The growing importance of Mobile as a port for trade with Central and South America is shown by the fact that there is now direct and regular communication from Mobile by various steamship lines to Argentina, Barbados, British Guiana, British Honduras, Colombia, Cuba, the Dominican Republic, Dominica, Guadaloupe, Guatemala, Jamaica, Martinique, Mexico (Progreso), Panama, Porto Rico, St. Christopher, St. Vincent, Trinidad, Uruguay, Venezuela. A direct service between Mobile and Porto Rico has just been inaugurated by the S. S. Massapeque of the New York and Porto Rico Steamship Company.

My office is prepared to furnish information of every character in regard to South American markets, having been established for the purpose of aiding southern merchants and manufacturers to establish trade relations with Latin American countries. Correspondence is invited and lists of firms in the more important South American cities who might take the agency for various American products will be furnished on application. Firms desiring to have letters and circulars translated into Spanish will be given every possible assistance. Any information that can be given or aid that can be rendered will be entirely without cost to the merchant or manufacturer.

DANIEL A. TOMPKINS.

On Sunday, October 18th, Daniel A. Tompkins died at his summer home at Montreat, N. C. He was 62 years old, having been born October 12, 1852, nine miles north of Edgefield, S. C. He was the son of the late Dr. De Witt Clinton Tompkins of Edgefield County. His mother before her marriage was Miss Hannah Virginia Smyly. Mr. Tompkins was by birth a representative southern man, one of his early ancestors, Stephen Tompkins, having located in Virginia as far back as 1750.

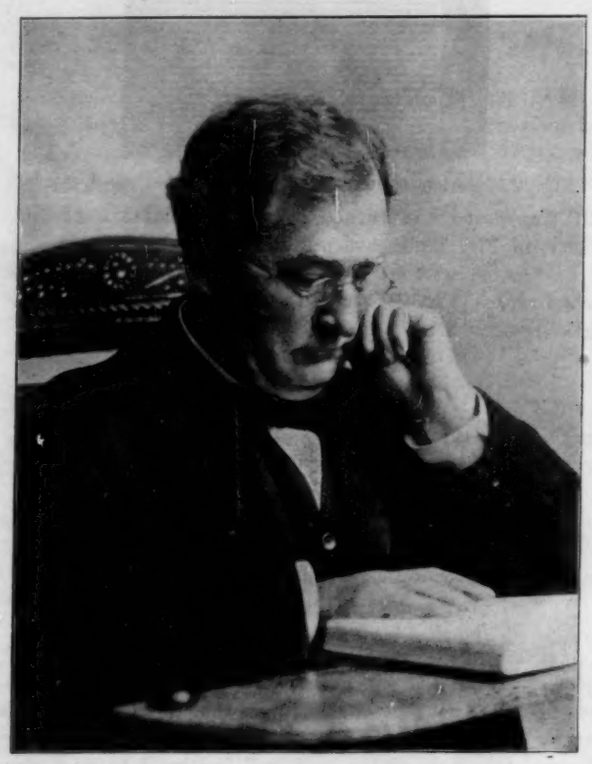
Following his natural inclination toward mechanics, he became a student at Rensselaer Polytechnic Institute at Troy, New York, where he was graduated as engineer in 1873. He felt, however, that his training was not yet complete and he served an apprenticeship at the machinist trade in the manufacturing establishment of John A. Griswold and Company at Troy. He then worked as draftsman with A. L. Holley at New York. Later he was a journeyman machinist and draftsman at the Bethlehem Iron Works of Pennsylvania. In 1880 he became master mechanic of the Crystal Plate Glass Works in Missouri and doubled the capacity of that plant while he was there.

Returning to the South in 1882 Mr. Tompkins saw the opportunity for industrial development and with energy, courage and intellectual force he devoted himself to the task of securing new industries. With what result he gave himself to this effort, North Carolina and the South now know. He was practically the original founder of the engineering and contracting business which has made Charlotte a center of engineering, machinery and factory construction. Urging that manufacturing be encouraged as a means of repairing the damage which he said the institution of slavery wrought in the South by driving out the free white labor, he made a vast contribution to this effort by developing the cotton seed oil industry in the South. He built perhaps as many as 200 cotton seed oil mills and more than 100 cotton mills. These with a number of sulphuric acid chambers and fertilizer works, electric light plants, and improved ginneries are monuments to his engineering skill and many of them to his initiative and advice. He founded and developed a machine shop for the construction of cotton oil and cotton machinery, and for doing other machine work, and he built textile school buildings, and assisted in the organization of textile schools for North Carolina, South Carolina and Mississippi.

In his capacity as one of the leaders of the economic life of the New South, Mr. Tompkins was connected with numerous industrial enterprises. He was president of the D. A. Tompkins Company, the Atherton Cotton Mills, the High Shoals Cotton Mills, and until a few years ago

was president of the Edgefield Manufacturing Company. He was for some time president of the Southern Manufacturers' Club, an organization which he largely promoted, and was a member of the Engineers' Club of New York. He was one of the founders of the Charlotte Sanatorium. Mr. Tompkins was owner of the majority of the stock in The Observer Company, publishers of the Charlotte Observer, and was secretary of the corporation at the time of his death.

In conection with the work which engaged his unfailing and keenest interest, Mr. Tompkins delivered addresses and wrote several books of high merit. He was the author of a "History of Mecklenburg County," "American



THE LATE DANIEL A. TOMPKINS.

Commerce: Its Expansion," "Cotton Mill Processes and Calculations," "Cotton Mill Commercial Features," "Cotton and Cotton Oil," "Cotton Values in Textile Fabrics," and an authoritative brochure embodying the results of a detailed investigation into the invention of the cotton gin by Eli Whitney.

About three years ago Mr. Tompkins suffered a stroke of something akin to paralysis. Since that time his health had been precarious and his death was not unexpected by those of his close friends who knew the circumstances. Of a generous disposition and overflowing with constructive ideas, his life has been a continuous performance of notable achievements, many of which now stand as permanent monuments marking the milestones of a splendid career.

A business man in the West Indies informs an American consular officer that he desires to communicate with American exporters of cotton and silk hosiery with a view to securing the agency for a line of goods. In replying address the Bureau of Foreign and Domestic Commerce and refer to file No. 13608.

FOREIGN TARIFF INFORMATION.

One of the interesting talks made at the first of the organization meetings of the new Georgia Manufacturers' Association, was by W. A. Graham Clark, the head of the Atlanta branch of the Bureau of Foreign and Domestic Commerce. Of particular value at this time were his special references to the work of the tariff division of the Bureau about which he said in part:

Many American manufacturers and exporters are apparently unaware of the facilities in the Bureau of Foreign and Domestic Commerce, Department of Commerce, for answering inquiries concerning the customs duties and customs regulations of foreign countries. Such inquiries are often addressed to American consular officers in foreign countries, as well as to commercial agencies, information bureaus, and foreign consulates in the United States. Replies to inquiries addressed to United States consular officers can be expected only after the lapse of considerable time. In many cases commercial agencies and information bureaus obtain their tariff information either from this bureau's publications or through special inquiries addressed to this Bureau, while certain foreign consular officers in the United States frequently refer tariff inquiries to this office. It is therefore evident that direct inquiries concerning tariff information addressed to the Bureau of Foreign and Domestic Commerce should be preferred by American exporters on account of promptness of service as well as accuracy of information.

The tariff work of the Bureau of Foreign and Domestic Commerce is not rigidly restricted to customs duties and customs regulations. The Division of Foreign Tariffs of the Bureau gives attention also to closely allied subjects affecting our foreign commerce, such as the internal revenue laws of foreign countries, the regulations for commercial travelers soliciting business abroad, and the requirements of foreign countries for consular invoices, merchandise-marks, standards of purity, and the like. The United States diplomatic and consular officers report on these subjects, and translators and other assistants in the Bureau of Foreign and Domestic Commerce examine carefully the official publications of the foreign governments in order that all information regarding foreign tariffs and these allied subjects may be kept up-to-date.

The answering of specific inquiries concerning customs rates and regulations has come to be an important part of the tariff work of the Bureau. The information desired is so varied in character that special statements continually have to be compiled. To facilitate the compilation of such statements and to insure accuracy, inquiries should invariably be precise and detailed both as to the nature of the article and the particular countries in which the inquirer may be immediately interested. In foreign countries many articles are subject to customs duty merely on the basis of the component material, and the inquirer should *always mention the component material* as well as the nature and use of his products. When such detailed description is given, the Bureau is the more readily enabled to indicate the foreign rates of duty.

The more substantial and better-known side of the tariff work of the Bureau is of course that of publication. In Daily Consular and Trade Reports, under the caption of "Foreign Tariffs," prompt notice is given of all important changes and proposed changes in the tariff legislation of

foreign countries; and quarterly the matter thus published is assembled and reprinted in pamphlet form as "Foreign Tariff Notes." The more comprehensive tariff publications, such as editions in English of complete tariffs and compilations of the duties on particular classes of articles, make up the "Tariff Series," of which there have been issued 28 principal numbers and the necessary supplements.

MEASUREMENT OF TEXTILE FIBERS.

Dr. N. A. Cobb of the Bureau of Plant Industry, Department of Agriculture, has forwarded to us the following description of an improvement on an important every-day detail, which will prove of interest to all fiber experts and many members of the manufacturing industry. He says:

"This note is hardly the place for the demonstration of the following theorem. However, it is readily capable of demonstration, and the reader with a mathematical turn of mind will at once perceive the line of proof.

"*Theorem.* If an infinite series consisting of straight parallel linear elements of every possible length each element arranged perpendicularly to and symetrically to a given straight line, be bisected along that line and the two half-series thus produced be placed with the former outer edges adjacent, then if the elements of one of the half-series be systematically rearranged, its longest element matched to the shortest of the other half-series and its next longest to the next shortest of the other half series and so on, a new parallel-sided series will be produced each of whose elements has a length equal to the mean length of the elements of the original series.

"If the theorem be changed so that the elements are stated to vary in length within prescribed limits, then for this modified theorem the line of demonstration as well as the final result is the same.

"If the number of elements is limited, say, for example, to a few thousand, the result becomes approximate; and if the elements instead of having their middle points on the given straight line are arranged so that their middle points fall at random on either side of the given straight line a distance less than half the length of the shortest element, then the reconstructed series will have a width approximately equal to the mean length of the original elements; for it will always be possible to pair the elements whose middle points fall to the right with those whose middle points fall to the left in such a way, the long with the short, as to secure the result stated in the theorem approximately, the degree of approximation depending on the number of the original elements and the uniformity of their increments in length when arranged in the order of their magnitude.

"It has been ascertained by comparison with the results of my accurate method of measuring the length of fine crooked fibers, a description of which has already been published, that if a series of fibers be arranged in a manner similar to that described in the theorems, the mean length of the fibers can be measured approximately, if proper allowance be made for the "fly-back," or apparent shortening of the fibers, due to their elasticity. The method is more definite and more accurate than that in common use by cotton experts.

"It is intended to publish details in connection with this approximate method in a separate publication."

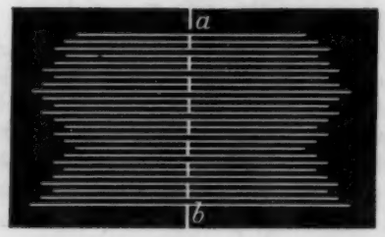


Fig. 1. Straight elements varying in length within prescribed limits, arranged symmetrically with reference to a given straight line, a-b, in accordance with the theorem.

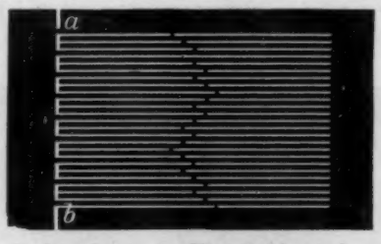


Fig. 2. Series shown in Fig. 1 bisected, and its left half transposed and turned over. For the sake of simplicity, in Fig. 1 the elements are so assorted that in Fig. 2 they match without rearrangement. The width of the second series (Fig. 2) equals the mean length of the original elements.

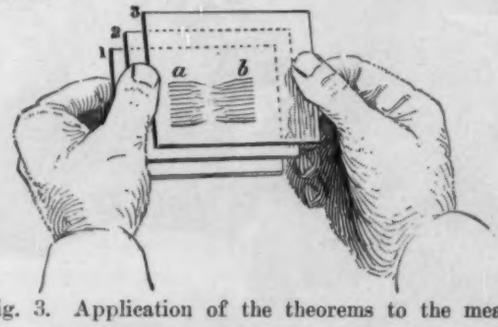


Fig. 3. Application of the theorems to the measurement of textile fibers in mass, for instance a "pull" of cotton fibers. The pull consisting of about 2,000 fibers, is cut in two transversely near the middle with clean sharp shears. One half of the pull "a," is placed between thin glass plates, 1 and 2 (lantern plate covers). The other half is placed between the glass plates 2 and 3. 1 and 2 are pressed firmly together with the left hand, as shown, while 3 is held loosely with only its left hand edge in contact with 2 and resting against the left thumb, its right hand edge being lifted so as to enable the operator to move the figers "b" back and forth over the fibers "a" by friction. Or the fibers "b" may be moved back and forth in any one of several different ways. Thus "b" may be moved back and forth by applying the left edge of 3 to the cut ends of the fibers. Care must be exercised not to disturb the parallelism of the fibers.

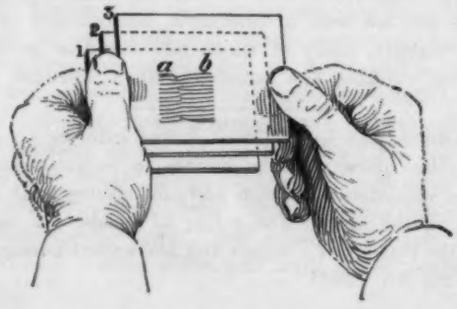


Fig. 4. The halves of the "pull" shown in Fig. 3 matched ready for measurement. The halves are adjusted against a strong transmitted light; "b" is so adjusted over "a" that the fiber masses present the same shade from end to end. When so adjusted the three glass plates are held in the left hand while the measuring scale is applied with the right hand. This simple optical method is found to approximate the conditions of the theorems. The width of the series as arranged in Fig. 4 represents the mean length of the fibers minus the "fly-back." This latter, about one millimeter in twenty-five for well conditioned cotton fibers, has to be added. The results are accurate to the fraction of a millimeter. The method is definite, readily learned, and easily applied.

FOREIGN TRADE OPPORTUNITIES.

The following foreign trade inquiries have been forwarded to the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C. Manufacturers desiring further information may address the main office at Washington or any of the branch offices, referring to the file numbers in which they are interested. Branch offices of the Bureau are located at New York, Room 409, United States Customhouse; Chicago, 629 Federal Building; New Orleans, Association of Commerce Building; San Francisco, 310 United States Customhouse; Atlanta, 224 Post Office Building; Seattle, 1207 Alaska Building; Boston, 752 Oliver Building.

No. 13723. Cotton Underwear.—A consular officer in England reports that a corporation in that country is anxious to negotiate with American manufacturers of cotton underwear. References will be furnished.

No. 13727. Hosiery.—An American consul in England reports that an English corporation is desirous of effecting agencies for a line of American hosiery.

No. 13744. Underwear.—A firm in England reports it desires to represent an American manufacturer of men's and women's underwear (cotton and wool), also boys' jerseys.

No. 13745. Cotton trousering.—An American consul in England advises that a firm of wholesale and export merchants in his district desires to be placed in communication with American manufactures of cotton trousering in 54 or 27 inch widths. Samples of the desired material may be had on application to the bureau.

No. 13747. Cotton yarn.—A consular officer in South America reports a firm of manufacturers of cotton knit wear and hosiery desirous of getting price proposals for cotton yarn. The firm states the yarn should be wound on cartoon spools, as indicated by samples, and if orders are placed, should be packed as lightly as possible in thin wooden cases, or in corrugated cardboard cases, crated. Proposals should be sent direct, with instructions as to cabling order. Sample will be loaned by the bureau.

No. 13770. Cotton underwear.—An English firm of merchants established for a number of years desires to communicate with American manufacturers of cotton underwear (fleeced goods a desired specialty) and similar goods. References will be furnished.

No. 13819. Yarns for hosiery.—An American consular officer in the East Indies reports that a company in his district is desirous of being placed in communication with American manufacturers of yarns for hosiery. The company advises that it is prepared to meet its obligations on settlement of terms. Catalogues, price lists, discounts, and full descriptive matter should be sent this firm. Correspondence may be in English.

No. 13831. Hosiery and underwear.—An American consul in England transmits the name and address of a dealer in his district desirous of negotiating with American manufacturers of cotton, lisle, and silk hosiery, and of ribbed underwear. The prospective purchaser is reported to be in close touch with both the domestic and export trade. References will be furnished.

No. 13839. Cotton goods, etc.—A manufacturers agent in the United Kingdom advises an American consul that he is anxious to get into communication with American manufacturers of men's cotton shirts and trousers, fleeced; ladies' cotton drawers and knickers, fleeced; ladies' cotton directoire knickers and combinations, fleeced; children's cotton combination, fleeced; knitted cotton vests for ladies and cotton jerseys for boys; ladies' and men's cotton hose and half hose. The correspondent states that he has been representing European firms for these goods, and that he has a trade established. He will supply samples of the lines wanted in his market. It is explained that the manufacturer should be able to supply a trade valued at $195,000. Trade references are furnished.

No. 13841. Underwear and hosiery.—An American consular officer in the United Kingdom has transmitted a communication from a firm in his district which is desirous of obtaining the representation of American manufacturers of merino underwear and hosiery, to replace Continental goods. It is explained that the members of the firm have a good knowledge of the requirements of the market and are in a good position to introduce business. References will be furnished.

No. 13973. Underwear and hosiery.—An agent and commission merchant in Great Britain informs an American consular officer that he would like to obtain agencies for American manufacturers of men's and ladies' underwear, particularly fleece lined, plain and fancy hosiery of all kinds, full length and half, and braces.

No. 13978. Underwear and hosiery.—A firm in England has advised an American consular officer that it desires to negotiate with American manufacturers of ladies' and men's underwear, knit goods of every description, and men's hosiery sundries. The firm is especially interested at this time in medium grades of silk hosiery.

No. 13992. Raw cotton, mohair, etc.—An American consular officer in Europe has transmitted the name and address of a dealer in his district who desires to establish a general agency immediately for raw cotton, wool, mohair, and other textile fibers, also textile machinery, looms, etc. It is explained that sales are made from samples and catalogues. References will be furnished. Correspondence should be in German.

No. 13994. "Leno" cloth.—A manufacturing company in Canada has informed an American consular officer that it is in the market for what is known as "Leno" cloth. The material is a coarse cotton netting used by manufacturers of fruit baskets as covers. It is stated the firm in question uses approximately 50,000 yards of this material per annum. The consular officer explains that there are a number of manufacturers of fruit baskets throughout the Dominion of Canada who might be interested in Amer-

ican quotations on this cloth. Heretofore most of this material has been purchased from European mills.

No. 14010. Gloves, upholstering goods, etc.—An American consular officer in Canada reports that a manufacturer's agent in his district desires to be put in touch with exporters of silk and lisle gloves, silk, lisle, and cotton seamless hosiery, balbrigan underwear, tapestry curtains and goods, tent ducks, khaki drills, and upholstering goods. It is explained that the agent estimates his annual sales at about $400,000 per annum. He is at present in the market for a $6,000 glove order. He states that it has been customary with the firms supplying him with goods to furnish all samples f. o. b. destination, and after their use as such, to be sold to the trade and remittance made. All correspondence should be in English. References.

No. 14019. Cotton blankets, etc.—A firm in the East Indies reports to an American consular officer that it would like to enter into business relations with American firms manufacturing cotton blankets, The firm is also interested in velvet, cotton and silk velvet ribbon, dyes, chemicals for dyeing, and piece goods. Correspondence should be in English.

No. 14034. Waterproof canvas.—A firm in the East Indies has advised an American consular officer that it desires to place a large order for American waterproof canvas. The firm explains that it will require a very large quantity of this canvas. Prices, etc., and time of delivery of 10,000 yards of each quality of canvas desired should be submitted at once. The consular officer explains that he has forwarded samples of the material. The samples may be inspected at the Bureau of Foreign and Domestic Commerce and its branch offices.

No. 14037. Cotton goods.—A firm of manufacturers in Canada advises an American consul that it desires to be put in touch with manufacturers of or dealers in cotton goods such as percale, gingham, outing flannel, and galatea. The firm desires, if possible, to purchase direct from the manufacturers. The firm is engaged in the manufacture of ladies' house dresses, children's clothes, aprons, etc. Reference is given.

No. 14060. Cotton and fleeced underwear and hosiery.—An American consular officer in the United Kingdom has transmitted a copy of a letter from a merchant in his district who desires to be put in touch with American manufacturers of cotton and fleeced underwear; also ladies' plain cotton and lisle hose. He desires to represent on a commission basis. References are given.

No. 14076. Stockings, shirts, jewelry, etc.—An American consular officer in South America transmits the name and address of a company in his district which desires to represent American houses exporting stockings, shirts, knit goods in general, materials for making waterproofs, paste jewelry, wire for woven wire bed springs, furniture, repair parts for agricultural machinery, materials for the manufacture of articles for traveling, and novelties in general. Correspondence may be in Spanish, French, German, or Italian.

With the opening of the Panama Canal a direct shipping route is now offered from the Atlantic coast of the United States to Australasia. This should be a helpful factor in creating a vastly increased trade with that resourceful and developing region. Direct steamship lines already ply between San Francisco, and Auckland, Wellington, and Sydney.

ANCIENT TEXTILE TOWNS.

The western theatre of the present war is charged with a textile interest of the past, and some of the ancient associations deserve memory, says the journal of the Royal Society of Arts. Compiègne is not only an assembling point for troops; it is a place which some two hundred years ago furnished "a Quantity of Stockins." At that time Senlis cloths had all but exhausted a repute in which they had been held earlier. Ferre had a name for wide serges. Rethel served to consume the wools of Champagne. Rheims, now the seat of the machine woolcombing industry, made "Cloth after the Fashion of Berry"—cloth, it may be assumed, not utterly unlike the Serges de Berry of our own time. Amiens and Chalons made serges, and the latter of these places lent its name to our shalloons, as the former did to the "Amens" which were copied one hundred years ago in the West Riding. Sedan made cloths in 1742 and it still makes them, and Elbeuf has been manufacturing woollens since a date unspecified but earlier than 1669. Abbèville in the 18th century had the credit of making "the best spun Wool of Picardie."

The rivalry of these French seats of industry was none too popular with those in England, who were straining efforts to prevent the Frenchmen from possessing themselves of English wool. On the whole, it may seem that our debt is less to them than to towns that have gained a world-wide notoriety from the war. Admitting the inestimable weight of debt to the Flemings at large, it is permissible to refer especially to Louvain. The perished city became a textile center in the 14th century, when local troubles dispersed the cloth-workers from Ghent, and grew to such eminence that it was said to have 150,000 journeymen weavers. Its industry declined in the 14th century and went in part to the Hollanders. If trust may be put in a tract of the 18th century, part came also to England. Chiding those who scoffed at foreign ability, the author of "The Case between the Clothiers and Weavers," reminded them: "We had our Skill from the Louvainers." So much ground exists for tracing the West of England cloth industry to the men of Louvain.

"Most of the yarns and cloths produced by Japanese mills are made from a mixture of Indian, American, and Chinese cotton, and the low cost of raw material thus obtained seems to aid the manufacturers in their struggle for the Chinese market as much as does their cheaper labor, especially as the labor is very inefficient. Japan ships cotton yarns and cotton goods to many countries, but its one large market is China, where it finds competition on yarn from India and cloth from the United States. The publications of the Japan Cotton Spinners' Association, as well as remarks by spinners, indicate that they fear the future competition of Chinese mills more than they do the American and Indian. The Chinese cotton industry is small but developing, and if the tariff is raised, as now proposed, the Chinese may quickly become a strong factor in the situation," says W. A. Graham Clark, in "Cotton Goods in Japan and Their Competition on the Manchurian Market."

Don't tell what you would do if you were someone else—Just show what you can do yourself.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

"Watchful Waiting" would seem to be the best motto for the emergency through which manufacturers are passing at this time. It has been wisely suggested that this is a most opportune time to mobilize our national forces—money, credit, commerce and industry. Naturally, the war continues the dominating factor in business affairs. The situation since our October letter shows some improvement, and at the first sign of definite organization we will begin measuring our chances in the big revival of business that is bound to come, though until then it seems best to let caution mark the way and circumscribe our actions. It is predicted on every hand, however, that an unprecedented boom in almost every line of American manufacture—textiles especially—seems unmistakably foreshadowed by the large number of requests for samples and prices that are coming at this time to American manufacturers and exporters. Manufacturers who are in a position to know say there is every indication that within a very short time every mill in the country will be running to its fullest capacity. Some of the manufacturers with whom we have talked hesitate to express themselves for publication, but say they put the utmost faith in the signs of optimism which appear on all sides, and they really can see nothing to prevent an almost magical growth of American industries—a growth which will very likely retain its new proportions; and these manufacturers are preparing for this new era of business. They add that all available labor will undoubtedly be employed, though at present the inability of a great many industries to obtain from abroad the ingredients and the materials which enter into their products must necessarily force some manufacturers to curtail. Prominent users of dye products say that they see no cause for alarm over the fact that hitherto almost all the dyes in the manufacture of the various textile products came from Germany, which country is now shut off from the commerce of the world. It is said that there is in the country now a supply which can be made to fill requirements for several months, and by that time, it is prophesied, Americans will have found a way to make their own products. The rumor that the Standard Oil Company is preparing to engage in the manufacture of dyes has, however, not been confirmed.

It is predicted that when the European war comes to a close it will be found that the stocks of cotton goods will have been so completely exhausted as to put the 146,000,000 spindles in the world back on a day and night basis of operation as quickly as forces can be gotten together. Germany has nearly exhausted her raw cotton and the mills, even in the non-belligerent countries, are not overcrowded. The fact of the matter is that the world is wearing out its cotton goods more rapidly than it is producing. The report goes that the recent orders from Europe for blankets and hosiery for the troops will aggregate 36 car loads in socks alone. Some of the mills have orders for 1,400,000 blankets, which is pretty good for a starter, and shows that the textile mills are early coming in for their share of the benefits from the war. The German government is buying only cotton blankets for the use of its troops, not only because of economy, but for considerations of convenience and cleanliness. Southern mills running on cotton blankets have been booking orders for several weeks past, and this is going to prove a tremendous item in the southern textile trade.

Our export trade is rapidly recovering from the first shock of war. The curious fact develops that the export business from New York is actually greater than it was at this time last year, in spite of the war. Gratifying gains are being shown over August and September. In imports the increase was $9,436,000 and in exports $45,831,000 over last month, the excess of exports in September being $16,900,000 against an excess of $19,400,000 in imports during August. The large orders received by American concerns for military supplies will serve to materially swell shipments abroad. In August and September our cotton shipments fell off about 1,000,000 bales, but this situation will be rectified when arrangements are made for financing the crop.

Undoubtedly the Lancashire cotton trade must pick up before long. It is a fact that the world outside of the war zone will still require vast quantities of cotton goods, and the present paralysis cannot continue indefinitely. Conditions in this country are sound despite the cotton bogey that is being continually flaunted in the face of the people. The unfortunate situation which has been created by the "buy-a-bale" enthusiasts and which is being prolonged for political purposes by certain presuming politicians, has induced many planters to place an inflated and arbitrary price on their cotton which is not warranted by the present supply and demand; and has also produced a false impression in many sections as to the solvency of the South as a whole. While cotton is our largest agricultural crop, cotton growing is not by any means the South's sole industry and the many records of increased business this fall over the same months last year and the year before indicate that the South is doing very well, thank you, and is not at present considering the declaration of a moratorium.

It would seem that the sugar refineries are going to help business by using cotton bags for packing the product of the refineries. Up to this time jute bags have been used. The cotton bags are slightly more expensive, but they are cleaner and more desirable in every way than the coarse and untidy jute.

In view of the forced curtailment of textile production in Europe because of the war, the increase of the South's spindles during the eighteen months from Septehber, 1912, to March, 1914, is of interest. For the entire United States there was an increase in active spindles of 1,308,818, of which 850,336 were in the southern states. This increase is practically equal to the total spindles of Canada

The Cannon Mills, at Concord and Kannapolis, N. C., have received recently an order from the British government for one million dozen towels for use of the army. They could not fill the order at once but shipped 300,000 dozen towels immediately.

The entire chain of Parker mills, located at Greenville, Columbia, and other South Carolina points, have resumed

full time operations. About eighteen mills are included in the Parker group, having a total equipment of 550,000 spindles. The average monthly consumption of these mills is between 5,000 and 6,000 bales of cotton, and 5,000 employees are necessary to keep up a full time schedule. The resumption of this full time schedule on the part of the Parker management has had a decided effect in restoring confidence in business circles of South Carolina. The demand for cotton goods from domestic, South American and European sources is given as the reason for full time operations. A number of mill men express the opinion that with big business in sight from Latin America, and with the returning better conditions in this country, there will be very little curtailment among southern mills in the near future.

A movement has been started among Boards of Trade in Florida to try and bring cotton mills to Florida, in anticipation of the expected boom in export business with Latin America. The Pensacola Chamber of Commerce has written to a number of cotton manufacturers asking them to consider the establishing of plants in Pensacola. Florida and Texas seem to be the two states most actively engaged in promoting cotton mills at this time.

Several of the cotton mills in the vicinity of Anderson, S. C., deny that any general curtailment is thought of and state that they have orders which will keep them busy until January at least, after which date it is thought that most of the unusual difficulties under which the mills are working at present will have been removed.

The Patterson Mills Company, at Roanoke Rapids, N. C., whose mill has been on a four-day per week schedule, is now considering running the mill full time again, to take care of increased business.

The Richmond Hosiery Mills, Rossville, Ga., have put some departments of their mill on a night and day schedule to take care of the large volume of business that is now being received.

Carding machinery is being installed in the Mariposa Mills, Mariposa, N. C., and it is expected that manufacturing will be started at an early date. This plant has been idle for more than a year. It was purchased several months ago by Messrs. Ormand and Davis, who now plan to manufacture 20's single and 2-ply yarns.

The French Broad Mfg. Co., at Asheville, N. C., are planning to add a spinning mill to their present quilt weaving mill.

At Chester, S. C., the Eureka Cotton Mills are reported to be running night and day, with several months' orders already in hand. The Manetta Mills at Lando, S. C., manufacturers of cotton blankets, are also running night and day, as is the Republic Cotton Mills at Great Falls, S. C.

The Burdette Mfg. Co., of Kansas City, Mo., has recently been organized with capital stock of $75,000. Carding and spinning machinery will be installed, and they will manufacture mop yarns. C. S. Van Noy has been elected president.

The Woodlawn Mfg. Co., at Mt. Holly, N. C., are adding combers, ball warpers and winders to their equipment.

J. T. Leonard, of Gainesville, Texas, is organizing a company to build a cotton mill, with $100,000 capital. It is proposed to invest all of the cotton that has been purchased by local parties there at 10 cents a pound in the purchase of stock.

W. N. Harrison and associates, at Greenville, Texas, are planning the erection of a cotton mill at that point.

Organization has been completed by the new Elberton, Mfg. Co., which took over the property of the Home Cotton Mills, at Elberton, Ga., early in the summer, and the plant is now starting up, on print cloths and cotton rope. J. C. Plonk, of Cherokee Falls, S. C., is president.

The Sylvan Cotton Mills, Shelbyville, Tenn., have placed order for new machinery sufficient to increase their production 3,000 pounds per day. They manufacture ducks and osnaburgs.

Progress is being made on the organization of the $500,000 mill by Fuller E. Callaway, of LaGrange, Ga., and his associates. They, however, have not divulged the nature of the product they will manufacture. The Park A. Dallas Co., of Atlanta, is preparing the plans.

It has been decided to build a large addition to the plant of the Whitney Mfg. Co., Whitney, S. C. The new installation will consist of about 13,000 spindles, with accompanying machinery, contract for which has not yet been placed.

NEW ENGLAND MILL SITUATION.

Many annual meetings of cotton mill stockholders have been held this month. The returns show the effects of a year of very high cost cotton and relatively low prices on goods. Owing to the great decline in cotton it has been necessary for treasurers to mark off a serious shrinkage in the values of cotton on hand, stock in process, and goods in the warehouses, and this has tended to make the financial results of the year most unsatisfactory. Several mills are now passing their quarterly dividends and many mills have reduced their dividends.

Thus far the mills have not begun to buy cotton freely. During the past weeks there has been some purchasing but as yet the movement has been restricted by the very high money rates and the inability to secure the financial accommodation asked for. Although cotton has been offered as low as 6¾ cents delivered at Providence for strict low middling, many manufacturers are doubtful concerning the wisdom of laying in a supply. The closed exchanges militate against a very general comprehension of the true value of cotton at this moment and as it is impossible to hedge in exchanges or provide with certainty that cotton may be had in the quantities required at the prices now quoted, there has been little or no attention given to the acceptance of late contracts for goods.

The values on many goods in the markets have already discounted the low cotton prices current. New England mills as a rule have not been meeting the cloth declines. They have sold spot goods for nearby deliveries but have been loath to accept any late business even though many trades offered have seemed inviting. There is still a great holding back in the matter of revising prices for goods in keeping with the decline in cotton. To a large extent this is due to the desire to conserve the unfilled contracts on the books.

There have been many attempts made to cancel orders still uncompleted but they have been met with refusal save in those cases where it has seemed unlikely that payment could be exacted. In order to tide over the uncertainty that is unavoidable during the period of adjustment to lower prices, many mills have curtailed their output. In some instances this has been done by closing down the mills for

two days a week. The Iron Works Mills at Fall River are now running on a four days a week schedule and the American Printing Company is only being operated alternate weeks, four days a week. The Algonquin and Pacific print works are being operated at about one-half their capacity.

Soon after the war started the finishing companies, and the printers who do job work for converters of fine goods, were overwhelmed with orders for work to be done in anticipation of the scarcity of dyestuffs. Now that a large part of those orders have been completed, forward business has come almost to a standstill, so that the large finishing companies and bleacheries are beginning to prepare for a dull period.

The dyestuffs difficulty is a very serious matter, yet buyers throughout the country do not so regard it. Many of them have been misled by the conflicting reports of dyestuffs conditions that have been printed, and it is only when some order is declined because there are not dyestuffs in hand to fill it that buyers are willing to concede that there may be something in the contention of manufacturers concerning the acute situation that has come about through the non-import of foreign materials. In nearly all the large colored goods mills orders are being accepted subject to the ability of the mills to get the dyes required. Much is expected of the promised importation of dyes through the intervention of the State Department, yet until the materials come to hand all colored goods manufacture must continue on a restricted or limited scale.

The outlook is much more confusing than it was a month ago, yet leading manufacturers still believe that the end of the year will begin to see a change that will be followed by a very large trade. Disappointment is expressed because of the slow adjustment of financial affairs and the continued closing of the cotton exchanges here and at Liverpool. The financial conditions in foreign countries are impeding export trade greatly. There is plenty of new foreign business being offered but those who tender it admit that they are at a loss how to provide payment for the goods that are wanted.

One sign of positive improvement is found in the reinstatement of many orders that were held up in the Philippines and the nearby markets of the West Indies, Central and South America. But while some new foreign business has come in, the conditions in China and Red Sea ports are still very poor in promise of future business.

It was expected that a revision in bleached cottons would be made this month. The Lonsdale lines were charged up at a reduction of ¼ cent a yard after having been on memorandum for six weeks. The Hill goods were charged up at ½ cent a yard reduction. The Lonsdale orders are now being accepted on memorandum again with a promise that the new price will be 7¾ cents or better. Even this reduction will not provide for what buyers look for as a consequence of low priced cotton, so that jobbers are not being encouraged to buy for future delivery. Some low count bleached goods have been sold in a limited way at a full reduction warranted by the drop in the staple, yet even in these instances sellers have not been able to move quantities of goods that are warranted by the very low prices offered.

Print cloths dropped to very low figures. Sales were reported in the New York market as low as 3½ cents for 38½ inch 64 x 60's, and at the end of the month there was a slight advance of ¼ cent a yard following a moderate amount of buying. As new cotton has hardly begun to go through the mills the sales that have been made represent substantial losses on the products. These losses, taken in conjunction with those sustained by the Claflin failure have made mills exceedingly slow to sell or to try to adjust themselves to the conditions that seem to be close at hand.

At this time of the year manufacturers who use napped goods in the manufacturing trades should be operating for another season on 36-inch cloths. But at this writing, neither buyers nor sellers have made a move toward new business. Suggestions of reductions from 7½ to 5½ cents a yard are heard of from New York but this does not meet with the approval of manufacturers at the present time. Some heavy domets used in the mitten trades were reduced and offered for next fall's delivery but the response from buyers was very unsatisfactory.

Cotton blankets, wide sheetings, and most of the very heavy colored goods such as denims and tickings, are held at full values. Prints and percales have not been reduced. It is contended by selling agents that jobbers are unwilling to buy and are not pressing as yet for a reduction in price that must be reflected in their stock taking next month. In any event, the hesitation in trade is very extended and the mills are quite willing to take the attitude that price reductions will imperil contracts and perhaps it may be good policy to hold off from revisions until as late a date as possible. One of the most troublesome things for the moment is the absolute drop in business offered to the fine goods mills. Prices on these cloths were holding pretty well until a week ago and now they are easing off materially.

Of course there are some bright spots in the gloom. Some underwear and hosiery mills have secured foreign business due to the closing of markets hitherto relied upon by London houses for their regular commercial supplies. And there have been some yarn mills making numbers used in the blanket and sweater trades that have secured round lots of orders to be filled promptly for goods to be shipped abroad for army use. There have been some orders received for khaki that have given mills employment, while two or three towel mills were able to secure considerable business from abroad. The large needs of hospital supplies such as bandages, etc., have given some mills considerable work on thin goods. But on the whole these orders merely represent stray business and it is not upon this sort of foreign trade that the largest hopes are being built.

The situation with machinery dealers is generally very dull. The usual volume of repair work has been cut down to the minimum while new work is being postponed wherever it is possible.

One of the very unsatisfactory developments of the month from the New England standpoint is the attitude the General Appraisers have taken in the construction of the Underwood tariff law bearing on jacquard products. Instead of a 30 per cent duty upon which manufacturers were relying, the recent decision of the appraisers leaves jacquard goods subject to the duties applicable to cloths under the regular cloth schedules. Having in mind the sturdy, and supposedly winning fight made by North Carolina interests for the benefit of all American cotton manufacturers, in having a fair measure of protection accorded to jacquard products, the action of the appraisers has come as a great blow to the mills and it has stirred up a great deal of condemnation of the new tariff schedules. It is freely predicted that cotton manufacturers will now be ready to join

with woolen manufacturers in trying to bring about amendments to the textile schedules that will prevent needless wrecking of the industries while trying to work toward a generally lower level of textile duties.

COTTON COMMENT.

BY H. AND B. BEERS, NEW ORLEANS.

New Orleans, October 23rd, 1914.

As yet the future department of the New Orleans and New York Cotton Exchanges remain closed, and there has been no trading on the curb, except for the purpose of liquidating old business.

In the meanwhile the financial situation in New York and in London has improved materially. The Bank of England is gradually building up its reserve, and the reserve of the banks of New York was only about $1,000,000 below the lawful requirements last Saturday; this week it will probably show an excess.

The St. Louis plan to raise a pool of $150,000,000, with which to care for the surplus of this year's cotton crop, is meeting with much success, and is looked upon with favor by the American bankers and has received the approval of the Government. If this plan is carried out, it will do much to relieve the depression in the South, will encourage farmers and merchants to hold for higher prices, and will undoubtedly cause American and foreign spinners to buy more freely of the staple, for their future as well as for their immediate requirements.

Compared with one month ago the price of cotton is down about two cents per pound, or $10 per bale, which represents a shrinkage in values of about seven cents per pound, or about 35 dollars per bale since the beginning of the war at the opening of last August. This is a deplorable state of affairs, and shows the necessity for the farmers to withhold their cotton from the market, for notwithstanding that only 2,103,000 bales of this year's crop has been marketed since August 1st, vs. 4,173,000 for the corresponding time last year, the holding movement has not been strong enough to bring about the desired results.

In Siam there are three kinds of trees which produce arboreal cotton, or nun, namely, the ngiu, the ngau, and the nun trees. These are particularly numerous in the north, although they also occur in the southern Provinces of Siam. The trunk and branches of the ngiu (*Bombax malabaricum*, or red self-cotton tree) are thorny and the blossom red; the ngau (*Bombax heptaphyllum?*) has either yellowish or white flowers and is without thorns. Both these trees grow to great heights, some even attaining 164 feet, and have a girth of 8 feet or more. They grow in far larger numbers in the jungle than near the villages, for the most part spontaneously, only a few having been planted by man. Their blossom and fruit very much resemble those of the nun. As soon as the fruit reaches maturity it is gathered. A tree about 65 feet high yields on the average 3,000 to 6,000 pods. If by chance these are left too long upon the tree the shell bursts and the seeds, together with the silk cotton that surrounds them, drop out. The cotton obtained from these two trees is yellowish white and almost as fine and glossy as silk.

THE KNIT GOODS MARKET.

The knit goods market looks better. Early in the month export orders began to show up in the underwear market and it was believed that this business if as extensive as seemed to be indicated by the inquiries, could not fail to help the fall situation in this country. Inquiries from foreign countries for woolen underwear have been going on for some time and early in the month these culminated in actual orders for several New York State mills. A number of negotiations were also going on for hosiery and sweaters also for export. Domestic underwear was quiet during this period, while domestic hosiery was busy in spots.

As the month wore on reports from the jobbing trade in various sections of the country showed a considerable amount of fall business moving. Considerable cotton fleeced underwear has been ordered and selling agents see a greater significance in this phase of the export trade than as if the army orders alone were being received. This is because the English business is being cut off from Germany and is finding an outlet in this country. The inquiries from England for ribbed underwear are also believed to be in the same category. One large Utica mill was reported to have taken an order for 20,000 dozen men's cotton ribbed goods.

With the middle of the month, came reports that while all the export business received is good and the possibilities for foreign outlet may be great, the underwear manufacturers in the Pennsylvania district were not being benefited to any great extent. Knitters of that section were inclined to take a gloomy view of the situation. The hosiery situation in that section was also considered poor although some full fashioned manufacturers were getting a fair volume of business. Some of the lightweight underwear mills were finding themselves in a rather undesirable position because they bought yarns for the light weight season at stiff prices and they have booked orders for the finished goods under normal conditions but they are not running at any more than 50 per cent of the capacity. Some others are also in a bad way due to cancellations of early orders placed by jobbers. Unfortunately there is no means by which they can get back at the jobber to make him live up to his contract without going through long expensive and tedious law suits that in the end do not bring satisfactory results. It is suggested that the knit good association take some steps to eliminate this evil. The situation among the Pennsylvania hosiery manufacturers is in many respects similar to the underwear situation. In spite of these pessimistic reports from the Pennsylvania section, it is still true that in many other sections, knit goods manufacturers are receiving fair orders and in many cases orders sufficient to require the operation of the mill day and night. With the raw cotton and yarn situation once stable there is little doubt but that knit goods manufacturers will receive adequate orders for everything they would be in a position to sell.

Cottonseed oil has exactly ten times the nutritive value of beefsteak and costs only half as much. As the United States makes each year over three million barrels of refined cottonseed oil, it is worth while to study the various methods of making it acceptable as food.

THE YARN MARKET.

The yarn market for the past month has not been a very satisfactory one for either spinners or buyers. Small sales for immediate use has constituted most of the transactions; deliveries have been poor; collections have been bad, and owing to their inability to hedge, spinners have turned down many orders for spring delivery. With a number of dealers September was reported to be the best month of the year so far and all of them did a fair volume of business, but when prices stiffened the buying began to drop off; 2-ply combed yarns in warps, skeins and on cones were quiet the early part of the month and knitters who used 2-ply cones seemed to be well covered and limited their buying to small quantities. There was also a very light buying of weaving yarns during this early period and the prices had a tendency to slide downward.

As the month wore on there were a few sales of 25,000 to 50,000 pounds of carded yarn on cones but they were the exception. Generally a few cases or a few thousand pounds was the extent of the individual sales. Two-ply combed yarns continued very quiet while single combed yarns were moving at a price. Mercerized yarns also continued quiet.

The middle of the month found prices growing somewhat weaker in the Philadelphia market and southern single combed peeler on cones was quoted as low as 19½ and 20 cents on a basis of 10's. On the other hand some of the eastern spinners who were not in pressing need of business were quoting frame spun combed peeler cones as high as 23 cents on a basis of 10-s. There continued little demand for fine 2-ply combed yarn. There was one sale reported of 150,000 pounds 50's 2-ply and 60's 2-ply mercerized twist warp to a mercerizer at 38 cents for the 50's and 45 cents for the 60's. There were no large quantities of lisle yarns on cones sold but there were a few inquiries for 10,000 to 25,000 pounds for 50's and 60's 2-ply for future delivery. Dealers who received the inquiry took this as an indication that knitters were getting business on seamless and full fashioned lisle hosiery. Sales of mercerized yarn were limited to small quantities for spot and quick deliveries; 40's 2-ply sold for 45 cents on cones; 50's 2-ply for 49 cents and 60's 2-ply for 59 cents. Weaving lines continued dull. There were some sales of 20's single warp at 15½ cents and 15 cents; 20's 2-ply warps sold for 16 cents and as low as 15½ cents.

As the month closes the demand for carded yarn seems decidedly weak, notwithstanding that the prices are at the lowest level they have touched for a good while. A reported sale of 50,000 pounds of southern mule spun was made on a basis of 16 cents for 10's cones. Many dealers are looking forward to still lower prices on yarns and believe that with cotton selling at 6 cents, the spinners will be able to make a little profit at 16 cents for 24's.

Sales of southern frame spun 24 cones have been made for 18 cents and 17½ cents and some offerings have been made even at 17 cents. Coarse numbers have been sold on the basis of 14½ cents for 10's while 40's splicing cones sold for 22 cents. There were some inquiries for deliveries in April and later, but the spinners are not disposed to accept contracts so far ahead. Being unable to hedge at the present time they are in doubt as to what they can do later in the purchasing of cotton. Combed yarns for single and 2-ply are very dull at the close. Weavers are not buying much 2-ply combed yarn and a sale of 36's 2-ply combed peeler on cones was made at 31½ cents; 40's 2-ply sold for 33 to 34 cents; 50's 2-ply for 36 to 38 cents, and 60's 2-ply for 44 and 45 cents. A limited quantity of 70's 2-ply combed peeler on cones was offered for 53½ cents while some other dealers were quoting 55 to 56 cents. While prices are holding down and orders are being withheld in the hope that prices will go still lower, there is an unquestioned feeling of buoyancy on the market and everyone is looking for better business a little later.

The following are recent quotations in the Philadelphia market:

Southern Single Skeins.

October 24.

4s to 8s	13 @13½	20s	15
10s	13½	24s	16
12s	14	26s	16½
14s	14	30s	17½ @18
16s	14½		

Southern Two-Ply Skeins.

8s	13½	24s	15½16
10s	13½ @14	26s	16½
12s	14	30s	17½
14s	14 @14½	40s	22½ @24
16s	14 @14½	50s	28 @29
20s	15	60s	35 @36

Carpet and Upholstery Yarns in Skeins.

9-4 slack	15½	8-3-4 hard twist	13½ @14
8-4 slack	14½ @15		

Southern Single Warps.

8s	13½	24s	16
10s	13¾ @14	26s	16½
12s	14	30s	17 @17½
14s	14 @14½	40s	22½ @24
16s	14½ @15	50s	28 @28½
20s	15		

Southern Two-Ply Warps.

8s	13½ @14	24s	16
10s	14	26s	16½
12s	14½	30s	17½
14s	14½ @15	40s	22½ @24
16s	15	50s	28½
20s	15 @15½		

Northern Two-Ply Carded Peeler Skeins.

22s	16½ @17	36s	20 @20½
24s	17 @17½	40s	23 @25
26s	17½ @18	50s	28 @29
30s	18½	60s	35 @35½

Two-Ply Combed Peeler Skeins.

20s	25 @25½	60s	42 @45
24s	26 @26½	70s	51 @54
30s	28½ @29	80s	61 @64
50s	35 @36		

Southern Frame Spun Yarn on Cones.

8s	13½ @14	20s	17
10s	14½	22s	17½
12s	15	24s	17½
14s	15½		
16s	16	26s	18
18s	16½	30s	18½ @19

Northern Mule Spun Carded Yarn on Cones.

4s to 8s	15½	20s	18½
10s	16	22s	19
12s	16½	24s	19 @19½
14s	17	26s	19½ @20
16s	17½	30s	20½
18s	18	40s	24

Northern Mule Spun Comber Peeler Yarn on Cones.

10s	21½	22s	24 @24½
12s	21½ @22	24s	25 @25½
14s	22 @22½	26s	25½ @26
16s	22½ @23	30s	27 @27½
18s	23 @23½	36s	32 @32½
20s	23½ @24	40s	35

STATEMENT

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(My commission expires June 24, 1916.)

COTTON MANUFACTURING.

DOBBY FIXING.

BY THOMAS NELSON.

Some of the troubles a dobby fixer has to contend with are misspicks in the cloth. An examination of fancy cloths in any of the department stores will show that many of these fabrics contain misspicks. In one piece of about fifty yards examined recently, a misspick occurred in every repeat of the pattern and to the writer it was clearly a case of neglect, for in all probability the cause of this defect was a peg short in one of the bars. It is possible that this might have been the first "cut" of cloth woven in that pattern and the peg had been left out of the chain. This could occur in two ways; first by the boy who pegged the chain not being as careful as he should be, thereby missing putting in a peg; or second, by the designer in his hurry to make the chain plan, either omitting marking a square which indicates a peg, or else marking so faintly that the pegger failed to notice it.

Now if a peg is left out of the chain or one drops out of the chain while the dobby is working and this peg governs a harness that weaves plain cloth, there is no difficulty whatever in detecting it in the cloth. If, however, the peg should be one which governs one of the sateen harness, the mistake or misspick is not so clearly discernable. To an experienced weaver, a peg out in either plain or sateen would be quickly seen, but to a weaver who has had little experience, a peg out on a sateen stripe would not be so easy to notice, especially if the sateen stripe is woven right side up which is generally the case.

In some fancy cloths a peg out in certain places is sometimes very difficult to detect and it is only on close examination that these defects can be seen. As a general rule, however, where a misspick is caused by a peg being out of the chain, the defect is readily seen and remedied because of the repeat each time in the pattern.

When a defect occurs in the cloth occasionally, that is, when a misspick is made, then the cloth will be all right for some time, then another misspick occurs, and so on; it is then that the value of a thorough understanding of the operation of all the parts of the dobby is valuable. There are quite a number of causes for misspicks, but for a general statement, a misspick is any defect in a dobby cloth whereby any ends or picks are not intersected regularly according to the weave of the fabric.

Suppose a plain and a sateen stripe fabric is being made and a misspick occurs in the sateen stripe. The stripe is woven right side up or in other words the cloth is woven right side on top so that the sateen stripe, being a warp stripe, would have the most ends on the face of the cloth. A six harness sateen would have five ends raised and one lowered on each pick; the harness shafts being lowered in the following order, 1-3-5-2-6-4 which is one of the best methods of lowering the harness on a six harness sateen. This means that each harness would be lowered on every sixth pick, but if anything should happen to keep a certain harness from being lowered on its regular pick, or if anything should happen to cause that certain harness to be lowered oftener than every sixth pick, it would show itself in the cloth.

Suppose a peg has been left out, the result will be that in every repeat of that pattern, that certain harness will be lowered two times in six picks, in other words instead of a certain harness being kept raised for five picks together and then lowered for one pick, the five picks will be broken up by lowering the harness in between them. From this it would seem that a misspick of this description should be very easily seen, and as stated previously, it is so to all experienced and careful weavers. But there is another point which must be taken into consideration. When a sateen stripe is being made, the ends are not set in the reed as open as they are in the plain weave, for it is always understood that a sateen stripe is made by cramming or crowding the ends together in that stripe. When a finer yarn is used for the sateen stripe than is used for the plain, there is more cramming, that is, more ends are used in the stripe because of using finer ends. It is this cramming of the ends together that keeps the misspick from being noticed as readily as it would be noticed in the plain stripe.

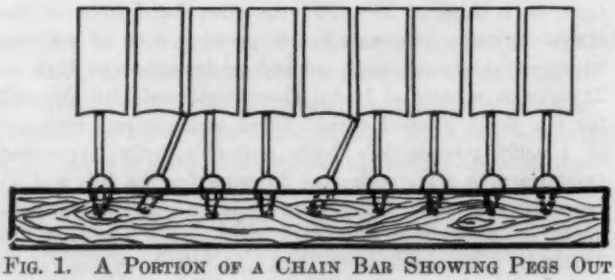


FIG. 1. A PORTION OF A CHAIN BAR SHOWING PEGS OUT OF POSITION.

The largest number of misspicks are, however, caused by the dobby and the chain carrying the pattern. It is not necessary for a peg to drop out of the chain to have a misspick, but there are other causes which will be enumerated.

First. Pegs in the chain bar not set straight. When a chain has to be pegged, the pegs must be put in the bar perfectly straight. Underneath each index finger, and where the peg comes in contact with the finger, a groove is made. This is for the purpose of keeping the peg in position and to prevent misspicks as far as possible. If, however, the peg is not put straight in the chain bar it will not work in the groove but will pass to the outside of the index finger it should operate and in this way the finger will not be raised on that pick, consequently the harness will not be raised.

Fig. 1 illustrates a portion of a chain bar with a number of pegs. The second and fifth pegs are bent to one side and pass in between the index fingers. It will be seen by this how, by passing in between the fingers, the misspick is made. There is more liability of having misspicks in this manner in a double index dobby because the fingers in this dobby are only about one-half the thickness of those on the single index dobby.

The index fingers must also be set perfectly straight and in line so that the pegs will pass straight under the fingers and in the groove. Every bar should be examined when a new chain is put on as this often saves considerable trouble which might occur later.

Second. Short Pegs. In the manufacture of the pegs, short ones are occasionally made. Considering the number of pegs used, it is somewhat surprising that there are not more short ones. When a short peg is used, the index finger is not raised as high as it should be with the result that the jack hook is not sufficiently lowered on the knife and the harness is not raised. Sometimes when using a shorter peg than is usual, the jack hook is lowered just enough to catch on the knife. In this way the misspicks may only be made at different parts of the pattern. The jack hook may be on the knife sufficient for the knife to pull out the jack hook the full distance on a number of picks, then as happens frequently, the jack hook does not catch quite as deep on the knife so that as the knife is coming out, the jack hook slips off and a misspick is made. Sometimes this slipping off of a jack hook will cause the shuttle to fly out because of the ends which are drawn through that harness dropping on the shuttle. In some cases the ends on the harness are broken out.

Third. Index finger binding. The index fingers must be set straight and must work freely. When an index finger has been raised by the peg in the chain, it should drop of its own weight immediately to its regular position. If by any means the index fingers catch or bind in any way they will not drop immediately and this allows the jack hook to be caught by the knife which raises the harness when it should be lowered.

Whenever there is any binding of the index fingers on a single index dobby, it will generally be found in the grate or guide through which the ends of the index fingers pass. The binding is usually caused by an index finger rubbing against the grate or guide. When this is the case, a readjustment of the fingers can be made, or as sometimes happens, the side of that particular grate is rough and this causes the binding. When this has been remedied by filing, the finger will generally work free. In old dobbies, where the index fingers are worn, these will be more or less binding because of the tilting of the fingers and the uneven working. There is not as much binding of the index fingers on a single index dobby as there is on a double index dobby because the fingers are about double the size and consequently about double the weight.

On double index dobbies, the index fingers are separated by pins in the pin board. The index fingers rest on the pin board and a pin, which is a piece of wire, passes between each of the index fingers. In this way there is more liability of the index fingers binding because of the little space allowed for them to operate. The index finger which operates the top jack hook through the needle has sometimes to have the pins opened a little wider than the finger which operates the bottom jack hook. This is because of the added weight of the needle and the least tendency to touch the guide pin will cause the finger to bind.

Fourth. Jack hook binding. When an index finger is raised by a peg or chain bar, the jack hook is lowered so that the knife will come in contact with it and raise the harness. If the jack hook should bind in any way it will not be lowered, consequently that harness will not be raised, hence a misspick will be made. It will frequently be found that the binding takes place at the connection of the jack hook with the jack. On many dobbies the end of the jack hook fits in a slot at the end of the jack, so that if the end of the jack should in any way be closed in, the jack hook will bind.

The slot can be very easily opened by a screw driver, the end of which, being put in the slot, will open it out. If, however, care is not used when doing this, the end will be opened out too wide and this in turn will give trouble. For example, the jacks are just close enough together to allow them to work freely and as will be remembered this is arranged by adjusting set nuts on each side of the jacks. If the ends of these jacks are opened out too wide, the jack next to it must be crowded for space. Now supposing this second jack to have been raised by the knife, then on its return to its position, instead of getting back to the correct position, it is held out by the jack which has been opened too wide and the harness shaft is not lowered as low as it should be, with the result that the ends in that harness are off the race plate, thereby causing misspicks and in many cases causing the shuttle to fly out. Not only this but if the jack for the first harness should have to be raised while the second jack was resting on it, both harness shafts would be raised and that would also cause a misspick. Frequently the first harness will drop back when lifted half way and this will cause the ends on that harness to be broken out.

The best method of telling whether a jack hook is working free or not is to raise up the hook and if it will drop of its own weigh freely, it is more than likely that it will work right, of course always being on the lookout to see that the end of jack is not opened out too wide.

A jack hook can also catch on the guide through which it passes. When this occurs the harness is not raised. Sometimes this will happen because the jack hook has by some means or other become bent. At other times the jacks have not been adjusted correctly by the set nuts and the jack hooks do not pass straight through the guide, causing them to bind. In some cases the binding is so slight that in looking for the cause of a misspick it is overlooked, but no matter how little the binding, there will always be a tendency for misspicks.

A NOVEL CHECK EFFECT.

BY J. W. K.

A novel check effect and in various colorings which may be used for shirtings, vestings, or skirtings, the weave being capable of many changes, is shown in Fig. 1. In solid colors or white the weave is very useful. Stripes of blue, green, heliotrope, and brown are in demand. By having colored grounds with white stripes and checks, some pleasing patterns result, which are very good for vestings.

The particulars for production are: 32 dents per inch, 3 ends in 1 dent, 20's and 40's ring twist warp, 64 picks per inch, 12's roving for filling. The full design is given C, Fig. 2, where the colored threads must be placed. The threads weaving plain should be placed on a small beam, separate from the 20's which should be on the large beam, on account of the difference in the counts and the tensions during weaving.

The usual width is 31 inches in the reed, for warp, which gives a 29½ inch cloth. For 80 yards of 20's warp, allow 86 yards for 40's warp. The length of the cloth will be about 74 yards.

The warping must be set out as follows:

Large beam (80 yards of 20's)

8 threads white
4 threads blue
8 threads white
4 threads blue

24 threads per pattern

Small beam (88 yards of 40's) 12 threads white 40's per pattern. 36 threads in one complete pattern ÷ 96

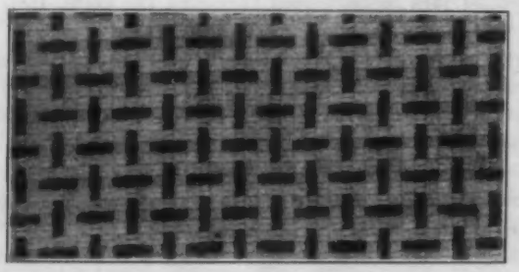


Fig. 1. A Novel Check Effect.

ends per inch × 31 inches in the reed = 2976 total threads in warp. 2976 ÷ 36 = 82 patterns + 24 threads over which can be used for selvedge.

Large beam = 24 × 82 = 1968 ends.

$$\frac{1968 \times 80}{840 \times 30} = 9.37 \text{ pounds 20's}$$

Small beam = 12 × 82 × 24 selvage = 1008 ends.

$$\frac{1008 \times 86}{840 \times 40} = 2.58 \text{ pounds 40's}$$

The total weight of fillings will be as follows:

$$\frac{64 \times 31 \times 74}{840 \times 12} = 14.56 \text{ pounds.}$$

The total weight of warp and filling = 26.51 pounds. 76 yards cloth ÷ 26.51 = 2.86 yards of cloth per

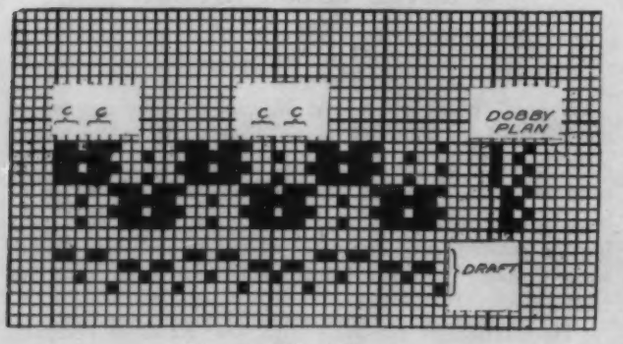


Fig. 2. The Design.

pound, loom state. It is advisible that the selvage threads on the small beam be of two-ply yarns. The threads being drawn on the heddles one two weaving plain, will give very neat edges to the cloth.

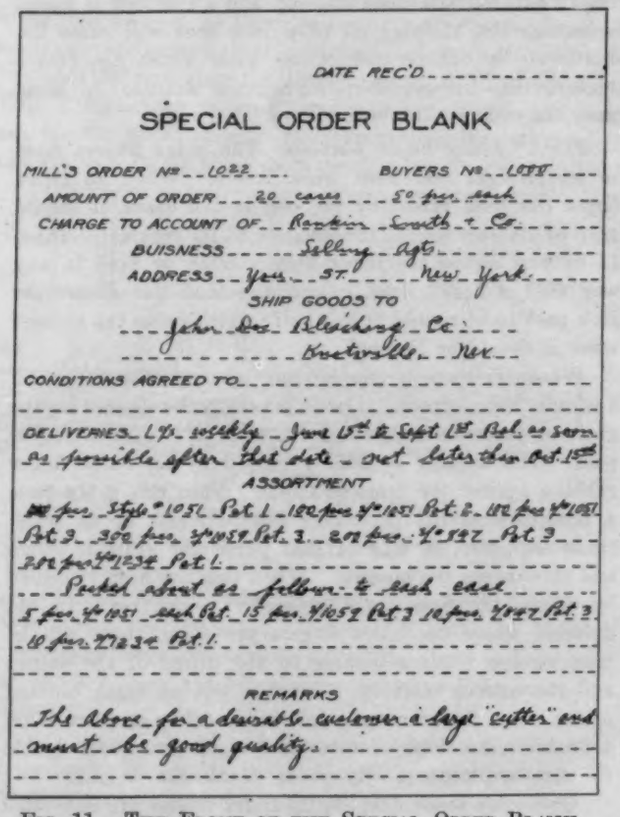
Check pattern, 8 picks white 16's and 4 picks red 16's, making 12 picks per pattern.

CLOTH ROOM METHODS AND MACHINES.

BY C. T. FALLIN.

So far we have dealt with this subject from the assumption that all our goods were to be baled or cased, each style of goods separately. But as the trend of the times is to a higher class of goods and an increased number of styles and for small orders; and as there is an increased disposition upon the part of the mills to do part or all of their finishing locally, these things complicate matters and demand a little elucidation here. While strictly speaking what is to be said is more in line with finishing and finishing plants than with cloth rooms, yet I feel that this article would fall short of its comprehensiveness if I did not touch upon such a very probable contingency.

In colored mills where the goods are finished locally or even a mill on gray goods running a great number of



DATE REC'D.....

SPECIAL ORDER BLANK

MILL'S ORDER No. 1022 BUYERS No. 1088

AMOUNT OF ORDER 20 cases 50 pcs. each

CHARGE TO ACCOUNT OF Robbin South & Co.

BUISNESS Selling Agts.

ADDRESS 99 ST. New York

SHIP GOODS TO

John Doe Bleaching Co.

Rockville, Nor.

CONDITIONS AGREED TO.....

DELIVERIES 1/3 weekly June 15th to Sept 15th Bal as soon as possible after that date not later than Oct 15th

ASSORTMENT

200 pcs Style 1051 Pat 1 100 pcs 4/1051 Pat 2 100 pcs 4/1051 Pat 3 300 pcs 4/1051 Pat 1 200 pcs 4/1227 Pat 3 200 pcs 4/1234 Pat 1

Packed about as follows to each case

5 pcs 4/1051 each Pat 1 5 pcs 4/1051 Pat 3 10 pcs 4/1227 Pat 3 10 pcs 4/1234 Pat 1

REMARKS

The above for a desirable customer a large cutter and must be good quality.

Fig. 11. The Front of the Special Order Blank.

styles on small orders in proportion to the size of the plant, a stock room or storage plant of some kind, where each style of goods may be stacked or stored separately, becomes not a convenience, but a necessity. The accumulation for an individual bale or case is often slow, and furthermore to meet the needs and desires of the customers the mill oftimes finds it either expedient or absolutely necessary to pack assorted bales or cases. Mills on colored goods, such as chambrays, ginghams, flannelettes, madrass and specialties are practically forced to cater to the trade in assorted cases.

These assorted cases will in some slight manner need adjusting to an otherwise perfect system of records and it might mean possibly the elimination of some forms, especially that of the shipping ticket, although a slight modifica-

tion of that would make it available and its authenticity of record, especially where a shipping clerk is separately engaged from the cloth or ware room. Its chief modification would consist in increasing its volume, as much more space would be required to give in detail each bale separately, or else a condensation leaving the entire detail to the order blank, giving only the gross yards and pounds, and making under style and pattern head the word assorted.

The greatest change would come in the order blank form which I think would require a complete change from the form already illustrated. I show in Figs. 11 and 12 the front and reverse sides respectively of a blank form to cover these special conditions. The illustrations are sufficiently explicit to need but little elaboration.

In such mills as mentioned the usual custom is to have a stock room either under the cloth room overseer's charge or a special packing room overseer. After the goods are finished and ready to pack they are weighed and the yardage taken of each style and pattern. These figures are

ORDER No 1022...

APPLICATIONS ON ABOVE ORDER

DATE PACKED	ASSORTMENT OF PIECES										CASE NUMBER	TOTAL YARDS	TOTAL POUNDS	DATE SHIPPED
	Style 461 Beam 65	Style 462 Beam 65	Style 463 Beam 65	Style 464 Beam 65	Style 463 Beam 65	Style 461 Beam 65								
5/24/13	5	4	6	13	12	10					47852	2500	412	6/15/13
5/25/13	5	6	4	17	8	10					47943	2496	403	6/21/13
5/29/13	5	5	5	15	10	10					48002	2502	413	
6/1/13	3	7	5	14	10	11					48100	2537	415	
TOTALS														

FIG. 12. THE REVERSE SIDE OF THE SPECIAL ORDER BLANK.

recorded upon some record, by modifying the bale record slightly we would have an ideal record for such a purpose.

These goods after being recorded are carried to the ware room and stacked, each style and pattern separately. When shipping day arrives, which is ordinarily once per week, this special order book is taken down and a memoranda taken of orders requiring the most urgent attention and with this information in hand the ware room is visited and every case or bale of goods applicable on these orders is put up, the detail yardage of each style and pattern showing on the baling ticket. Also the order number for which this particular case was packed. From this slip the special order book is posted, after which the ticket is disposed of as previously outlined. From this order book the "Bale Record," which is now a stock record, is credited and by extracting the balance one can know at any time the amount of goods of any style and pattern on hand in ware room and available for packing.

After the urgent orders are attended to, the usual custom is to extract the balances on the stock record and put up all possible cases for future shipment. Most mills are content to keep their stock records in pieces only, but a little devising will make these records available for keeping the records in yardage as well. If yardage is desired instead of pieces, yards and not pieces must be substituted on the special order book somewhat as illustrated in Fig. 12, Bale No. 47852.

Having given a practical and comprehensive record system from which any mill can get something that will prove beneficial, possibly not by adopting every suggestion and utilizing every blank form presented, and possibly not by utilizing any of them in the exact form as presented, but rather by an absorption of ideas and the application and amplification of them to suit the exact local conditions of each mill, I have now completed the system and its discussion, and will in the next chapter take up the subject of the machines and processes used.

DESIGNS FOR FANCY COTTON FABRICS.

BY THOMAS WOODHOUSE AND JAMES IRELAND.

PART SIXTEEN.

A very broad and prominent stripe pattern made with the Bedford cord and the plain weave is illustrated in Fig. 66. The plain stripe contains 116 threads of heliotrope while the Bedford cord stripe is made up of alternate bands of 6 threads each of white and blue, 19 groups in all. There are therefore 230 threads in each repeat of

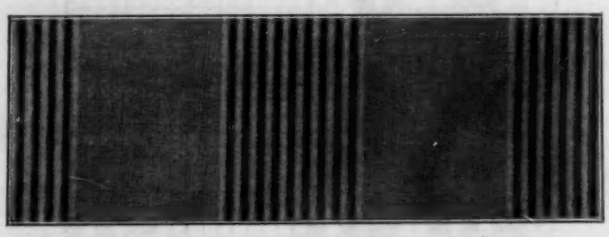


FIG. 66.

the pattern, with 88 threads per inch and 88 picks per inch of heliotrope filling, hence the plain broad stripe is self-colored. The full design and draft appears in three sesctions at X and Y in Fig. 67, and the weaving plan on 6 harnesses is shown at Z. The same weaving plan could be utilized for the cloth at G, Fig. 60, and also for the cloth M, Fig. 62, provided that the necessary rearrangements were made in the drafts.

An elegant all over crepe effect is shown in Fig. 68.

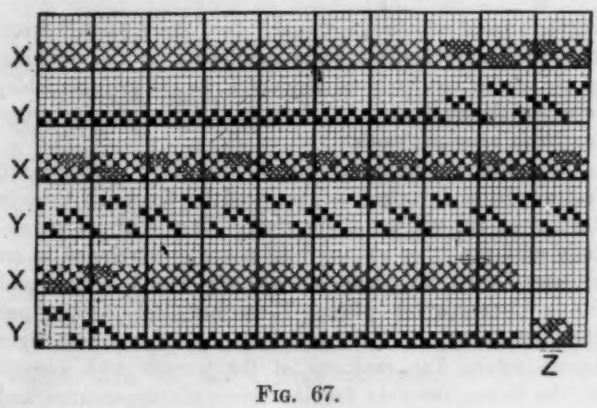


FIG. 67.

In certain lights a decided fancy diagonal twill to right appears, while in others the effect resembles the overlapping parts of a pine cone. Warp and weft are straw color, but equally pretty effects result with many other self-colored

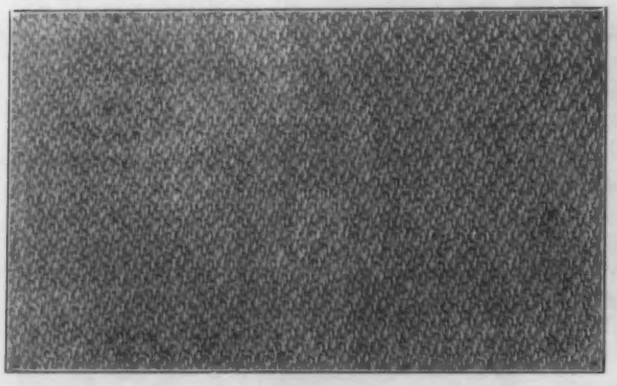


FIG. 68.

warps and wefts. There are 72 threads per inch and 52 picks per inch of 2-ply twist yarns. Four repeats of the weave are shown at A in Fig. 69, the unit appearing in solid marks. A straight through draft B on 8 harnesses is necessary, and the weaving plan C is therefore identical with each unit of the design. It will be understood that this condition always obtains when no two threads in the design are alike, and when the draft is straight over from front to back. These straight drafts are ideal from a

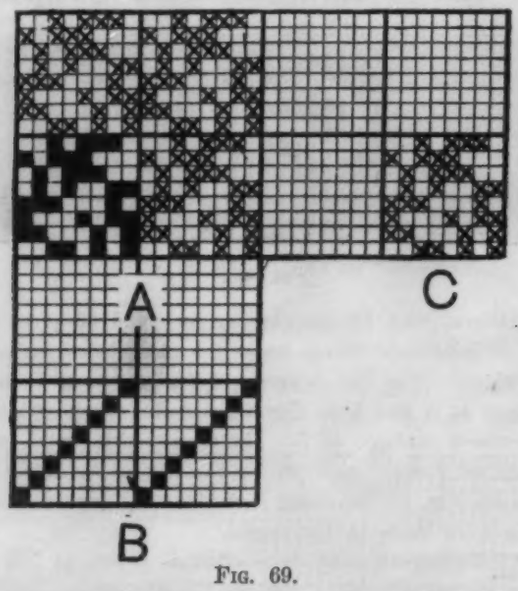


FIG. 69.

weaver's point of view, and when they are departed from it is invariably because some peculiarity in the working of the mechanism involved renders a change more suitable, or where the mechanism has been fixed up in another order for some previous work.

The cloth illustrated at Fig. 70 has for a predominant feature the small triangles developed by the warp threads floating on the surface of the cloth. They contrast beautifully with the other but inverted triangles developed in an apparent warp rib weave, but actually with the warp and filling inter-weaving plain. There are 160 threads per inch, 40 picks per inch, and both are of a 2-fold light brown color. The rankness of the threads with respect to the filling accounts for the warp rib appearance and the filling is perfectly hidden, lying as it does between the upper and lower layers of warp threads and helping to form what is in reality a three-layer fabric. When such conditions obtain the filling lies in an almost perfect

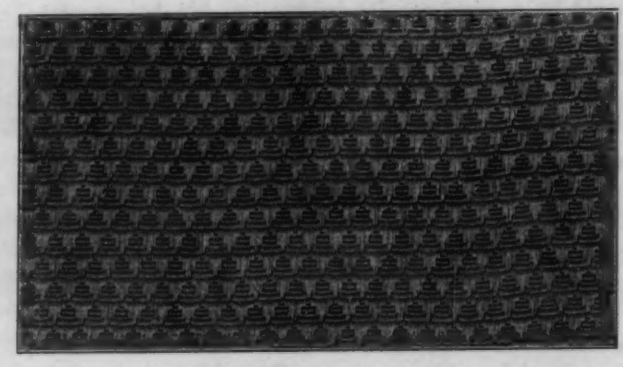


FIG. 70.

straight line, and the bending of the warp is at a maximum for the particular counts of yarn used, whereas the contraction from reed width to finished width is slight.

The full design for the pattern on 24 threads and 10 picks is given at D, Fig. 71, and those threads which float on the surface for the triangles are shown in solid marks. When the design is considered along with the number of threads and picks per inch, it will be clear that it is a reversible fabric. The draft of the harness is shown at E, while the weaving plan, on 8 harnesses and 10 picks, appears at F. A further glance at the weaving plan shows that successive pairs of harnesses work opposite to each

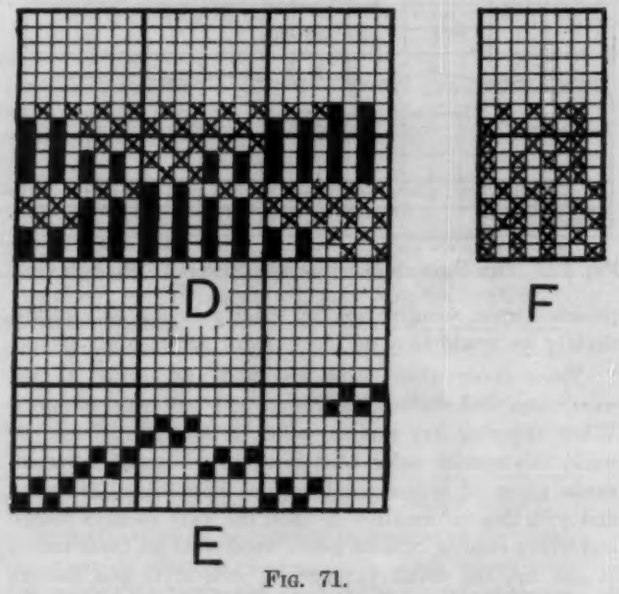


FIG. 71.

other; when this is the case it simplifies the trimming of the harnesses in the loom, especially if the work is performed by tappets and roller mountings, while for jacquard work, similar conditions in the lifting of the warp entails a minimum number of needles and cards. For self-colored effects such as we have illustrated in Figs. 68 and 70, where there is a probability of preparing a large variety of different colors, it is most convenient to weave all in grey or white, and then piece dye them to the shade or tint desired. This method also facilitates weaving because the threads are at their maximum strength and most easily seen when white.

(To be continued.)

KNITTING DEPARTMENT.

DESIGNING ON THE SPRING NEEDLE CIRCULAR FRAME.

BY WILLIAM DAVIS, M. A.

THE PRESSER WHEEL.

It is usually a matter of extreme difficulty to understand how the presser wheel, with its circular form, produces patterns which appear in the shape of squares, and for the better understanding of this question, design 9 has been drawn out, small in size and to be worked on a single-feed machine with one tuck presser. The design is of diamond shape and is 6 needles wide and 6 courses high, which means that a single presser of $6 \times 6 = 36$ teeth would suffice for a coarse gage frame, whilst for a finer gage it might be necessary to repeat the pattern twice round the circumference and thus admit of the use of a convenient size of wheel. Taking square 1 on the extreme left of Fig. 9, the wheel would be cut by starting the top row with the first needle on the left hand side, continuing each row in succession, till the bottom row is completed. Adopting the line method of representation already explained and placing the tuck stitches above and the untucked loops below the line, the full design would be given by:

$$\frac{1\ 1\ 1\ 1\ 2\ 1\ 1\ 1\ 1}{3\ 4\ 1\ 2\ 3\ 6\ 3\ 2\ 1\ 1} = \text{total of } 36.$$

Figure 9 represents the diamond design as it is worked in the fabric with a one-feed frame, each repeat rising

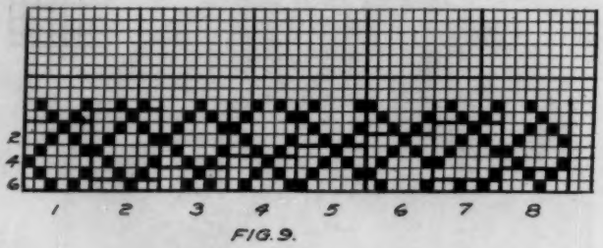


FIG. 9.

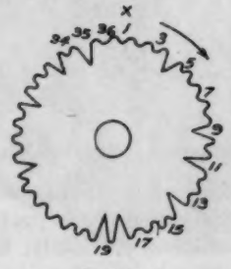


FIG. F.

DESIGN 9 AND PRESSER.

one course higher to the right. Thus it will be noted that the design repeats itself after the 6th rise, the 7th bringing the pattern round into exactly the same position again. Thus it is that the design, although rising continuously towards the right are shown one diamond directly under another in a vertical direction. Let the design now be examined along one line in a horizontal direction beginning at the top course of design 1, continuing over course 2 of design 2, course 3 of design 3, course 4 of design 4, course 5 of of design 5, and finally course 6 of design 6; this reading exactly corresponds to the formula just given for the whole wheel cut from the top to the bottom course of one single square, and it is thus that the design is actually transferred to the fabric. The presser wheel is shown at Fig. F.

When only one design is given and the method of cutting the wheel from top to bottom explained, it causes the mis-apprehension that the design is made in a similar manner in the fabric. It will now be seen however that what the wheel really does in the course of its revolution is to insert a further horizontal line into the incomplete diamonds found all round the machine. It will be evident that precautions must be taken similar to those explained for simple designing, that is, the number of needles in the machine must be such as to avoid the same needles being pressed at each revolution. If, for instance, the number of frame needles could be divided exactly by 36, the number of teeth in the presser wheel, then the tucked stitches would accumulate on the needles and in the space of a few courses, considerable breakage would result. The relation of frame capacity to that of the presser wheel must, therefore, be such that the needles of the frame can be divided by the teeth of the presser wheel with 6 more or 6 less than an exact number of repeats. It is of little consequence whether the number be + or —, if the number is — 6, then the 6 needles on which the top row of the design was worked are used for the 6th row at the next repeat which has the result of causing the designs to rise to the right, but if the + 6 arrangement be chosen, the design runs from right to left of the fabric on the side next the worker. To reduce this to a formula which admits of general application, let N again represent the number of needles the frame possesses and P the number of teeth round the circumference of the presser wheel, with x any convenient and suitable integer showing the general relation between the teeth in the presser and the needles in the frame:

$N = Px$ plus or minus 6.

For the design under consideration, $P = 36$ teeth and let $x = 8$, which gives: $N = 36(8)$ plus or minus $6 = 288$ plus or minus $6 = 288 + 6 = 294$ or $288 - 6 = 282$.

A frame with 294 or 282 needles in the circumference would be suitable.

For $x = 14$ we have a finer machine given by $N = 36$ (14) plus or minus $6 = 504 + 6 = 510$ or $504 - 6 = 498$.

To secure the proper rise of design it is very necessary to have the width as an important factor. In design 8 the width of the design is 12 needles and the height 10 courses, so that the number of teeth in the presser wheel is $12 \times 10 = 120 = P$. If $x = 4$, the number of needles N is given by $N = Px$ plus or minus 12. $N = 120$ x plus or minus $12 = 120$ (4) plus or minus $12 = 480 + 12 = 496$, or $480 - 12 = 468$. Frames with 496 or 468 needles would be suitable.

Again it will be evident that this problem will only be useful when one has a large assortment of frames and

wishes to select one of correct capacity for the design under consideration, but the problem in practice much more often is given, a frame with fixed number of needles, required to find the capacities and sizes of presser wheels which will work on it. To consider the problem and arrive at some formula which will enable us to find by calculation suitable presser wheel sizes for any capacity of frame, it will be needful to revert to one of the given designs, as an example, say design 8. Let the height of the design be represented by (a) and the width of the design by (b), then the total number of teeth in the presser

FABRIC G.

wheel is represented by a $\times$ b = ab. In the case of design 8, the height of the design is 10 and the width 12, so that the capacity of the frame must be such that ab will divide into it and have as a remainder + 12 or — 12, for only in this way can the pattern be built up in succeeding courses.

N plus or minus 12 $\div$ ab = x where x is a suitable interger, by which is meant that the number of teeth in the presser wheel must divide into the frame needle number with 12 more or 12 less. But a = 12. Therefore N plus or minus 12 $\div$ 12 b = x, but that this condition may hold good, N, the needles of the frame, will also require to be divisible by 12, and this can be shown by N = 12 n. By substituting we get: 12 n plus or minus 12 $\div$ 12 b = x = 12 (n plus or minus 1) $\div$ 12 b = x. Taking out the 12 factor above and below the line we obtain (n plus or minus 1) $\div$ b = x. This formula shows that the suitable height or heights of pattern (b) may be found by dividing the needles N of the machine by the given width of pattern and obtaining the number (n), 1 is added or subtracted from it and the resultant factors taken as the suitable heights.

This can be more forcibly explained by working out the problem of finding suitable heights for a given frame with a known number of needles in the circumference. Let the number of needles in the frame be 612. We must begin by taking some convenient width which will divide into 612 without a remainder, say 12. From the formula we have N plus or minus 12 $\div$ 12 b = x, but N = 612 = (12 x 51) = 12 n. 12 n plus or minus 12 $\div$ 12 b = (12 x 51) plus or minus 12 $\div$ 12 b = x, 12 (51 plus or minus 1) $\div$ 12 b = x, eliminating the factor 51 plus or minus 1 $\div$ b = x or 51 plus or minus 1 $\div$ x = b, therefore 52 $\div$ x = b or 50 $\div$ x = b. This means that this height (b) of suitable patterns for a 612 machine will be found by taking x as any convenient factor of 52, say x = 4, 52 $\div$ x = b. 52 $\div$ 4 = 13, which indicates that a pattern 12 broad by 13 high = 12 x 13 = 156 teeth in the presser wheel, would fulfill all the requirements. In the second case of 50 $\div$ x = b, if x be taken as 5, then (b) will become 10, which will also be a suitable height of pattern. Taking x as 2 would make the height (b) 25, but a pattern 12 $\times$ 25 = 300 teeth in the presser would be much too large for the standard make of machine to conveniently accommodate. To obtain other suitable presser wheels for a 612 frame we endeavor to resolve the number into its convenient factors: 612 = 12 $\times$ 51 = 12 $\times$ 3 $\times$ 17. 17 can be taken and this divided into 612 gives (17 $\times$ 36) plus or minus 17 $\div$ 17 b = x, 17 (36 plus or minus 1) $\div$ 17 b = x.

Dropping the factor 17, plus or minus 1 $\div$ b = x or 37 or 35 $\div$ b = x, but 37 cannot be broken up conveniently, so taking 35 we have 7 x 5, either of which may be chosen, but as 7 is the more likely to give a pattern of convenient dimensions, width 17, height 7 = 17 $\times$ 7 = 119 in the presser wheel.

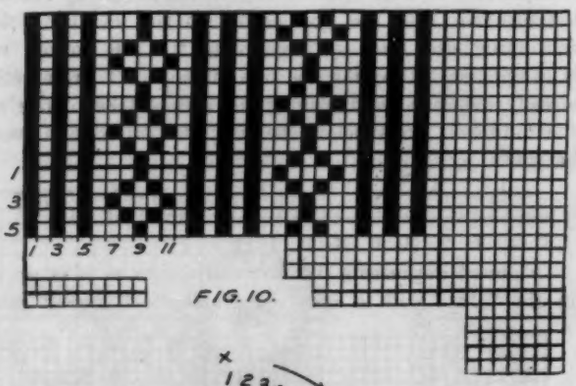


FIG. 10.

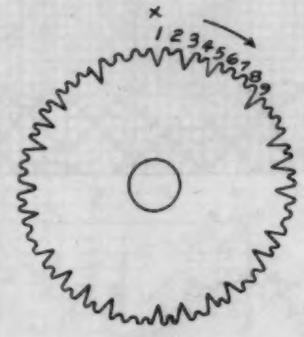


FIG. M.

DESIGN 10 WITH PRESSER WHEEL.

Some further designs of approved character are given herewith along with the actual cloths produced from these designs. As was mentioned previously, the most definite effects are obtained by the use of two colors, one light, the other dark. Frequently the ordinary presser does not give clear effects where two, three or more needles are concerned. If the pattern is white on the face, then the black slips beneath it, but is actually on the same stitch so that when it occurs in more than 2 courses, the black yarn shows a strong tendency to show through on the white face and thus disturb the purity of the figure. To remedy this, a press-off wheel is introduced on alternate feeds to press-off the offending stitches, so that they lie

loosely on the back of the cloth and allow the other color full scope in its effect on the face. Fabric G corresponds to design 10 and presser wheel Fig. M. The black yarn floats loosely on the back at the white diamond portions,

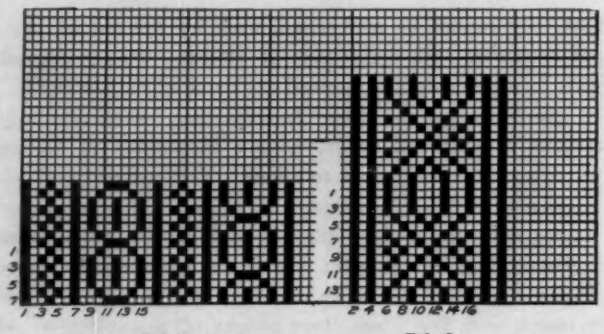


FIG. 11 FIG 12.

DESIGNS 11 AND 12.

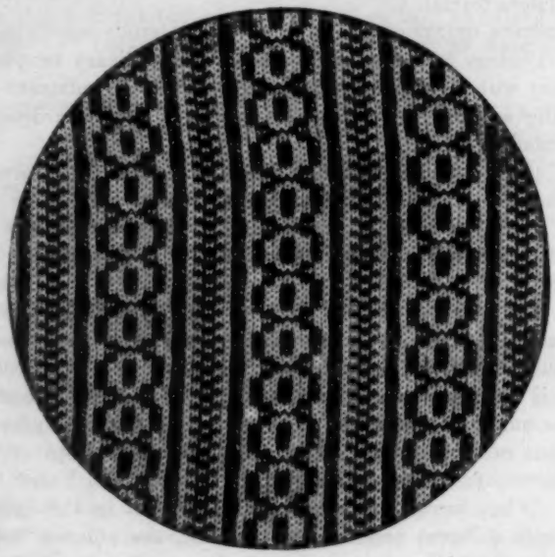
but the white is not pressed off onto the back for the black vertical stripes portion, with the result that the white may be seen to be shining through somewhat on the face, showing white specks on the black lines.

From the point of view of fabric structure, it is not desirable to have yarn floating for more than 3 or 4 needles on the back and even floats of this size occurring frequently give the resulting fabric a "sleezy" handle. When the pattern is totally press-off fabric, the alternate pressers say of even number are cut exactly the reverse of the alternate pressers of odd number, thus if the pattern were

3 2 1

1 1 1

then the first presser would be cut in the ordinary manner,



FABRIC H.

but the next presser would be reversed in its cutting, namely:

1 1 1

3 2 1

If, however, only part of the design is to be pressed off then the auxiliary presser would be cut at those points only. Design 10 extends for 12 needles in the width and 5 courses in the length so that the presser would have $5 \times 12 = 60$ teeth. The wheel would be started at the top left hand corner of the repeat and the cutting would be continued along each course, to the end of course 5, as follows:

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1 1 3 3 1 1 2 1 2 1 1 1 3 1 1 1 2 1 2 1 1 3 3

The numbers above the line indicate the parts cut with deep or tuck teeth, the numbers under the line are cut in the normal way. Worked one course black and one course white, the design, quite simple in its appearance on squared paper, yet looks quite effective in the fabric.

Design 11 is the effect shown in fabric of Fig. H, worked similarly, 1 course white, 1 course dark and on examination of one repeat it will be noted that the pattern

FABRIC L.

extends over 16 needles in width and 7 courses in length, giving $7 \times 16 = 112$ teeth in the presser wheel. In this pattern for the maximum floats are much larger than those of design 10, for inside the diamond, on needle 11 and 13, it is noted that white shows on the surface for 6 courses, needles 10 and 14 show white on the surface for 4 courses. On examining the back of the fabric, it is seen that the dark color floats freely under such portions.

Design 12 gives the design for the effect given in Fabric L, and is of much larger dimensions. The extent of one repeat is 16 needles in width and 14 in length, giving in all $16 \times 14 = 224$ teeth in the presser wheel.

(To be Continued.)

Australian imports of American merchandise in 1909 aggregated $28,886,278 in value, of which $24,347,732 worth was received direct, while the balance was shipped via Canadian, European, and Asiatic ports. Australia made steadily increasing purchases of goods from the United States during the quinquennial period following 1909. The total in 1912 was $52,384,257, of which $45,986,250 worth came direct from American ports. Australian statistics, showing details of the Commonwealth's foreign trade for the calendar year 1913. will not be available for several months.

Dyeing, Bleaching and Finishing.

NOTES ON DYEING, BLEACHING AND FINISHING.

BY J. MERRITT MATTHEWS, PH. D.

MILDEW IN COTTON GOODS.

The mildew occurring in cotton goods is not caused by any one specific organism, but to a large variety of both fungi and bacteria, commonly present in the air, among which the following have been identified: Penicilium glaucum, Fusarium, Mucor racemosus, B. megatherium, Sarcina aurantiaca, etc. It has been shown that spores of these are present in non-mildewed cloth, and such organisms are probably present in nearly all cotton goods, only awaiting favorable conditions to develop. The mildew is produced by these common moulds feeding upon the starchy matter in the size; but as the fungi can only develop in the presence of sufficient moisture, the goods must become damp before there is any likelihood of mildew developing. The use of hygroscopic salts favors this condition by causing the cloth to absorb an abnormal amount of moisture.

ACTION OF WATER AND CAUSTIC SODA ON COTTON.

M. Robinoff has recently studied the action of dry heat on cotton, also that of water at high temperatures, dilute acids, concentrated and dilute solutions of caustic soda. The main conclusion arrived at is that cotton cellulose which has become modified in the course of industrial chemical treatments possesses totally different properties from the normal cellulose of cotton. The normal cellulose is extremely resistant to most chemical reactions and is only slightly modified when boiled with water under pressure. On the other hand, cotton which has been subjected to boiling and bleaching processes, is very considerably attacked when boiled with water under pressure. This is especially true when the temperature rises above 300 degrees F., and such cotton is completely broken down to hydrocellulose when digested under a pressure of 20 atmospheres. The duration of the treatment does not appear to have any appreciable influence. Dilute solutions of both cold and hot caustic soda do not have any effect on the structure or chemical properties of cotton cellulose, but effects are to be had when the temperature of the solution is elevated above 212 degrees F. A caustic soda solution possessing a concentration of 4 per cent appears to be quite active in its effect on cotton. In this case also the time of action does not appear to have much influence. Dilute acids also cause a hydrolysis of cotton cellulose. In souring after bleaching it would seem that dilute acids act more strongly on the cellulose of cotton than acids of double or four times the strength. Acetic acid, in this connection, appears to have as great an action as hydrochloric acid.

ACTION OF FORMALDEHYDE ON ARTIFICIAL SILK.

There have been continued attempts made to produce cellulose silks that have a higher degree of tensile strength when in the wet condition. Recently a treatment with formaldehyde has been proposed, and experiments seem to indicate a reasonable degree of progress. When cotton, wood-pulp, or other forms of cellulose are treated with formaldehyde their properties are modified to such an extent that they cannot be mercerized, even by the aid of heat, nor converted into derivatives of viscose. This treatment with formaldehyde has received the name of "sthenosising." In the same manner flour and starches, when similarly treated with formaldehyde, become insensitive to boiling water and to caustic soda solutions. This property of cellulose may be taken advantage of, especially in the case of viscose silk, to produce threads and fabrics of a much increased tensile strength. For example, when skeins of viscose silk are heated in an autoclave at 140 degrees F. for 8 hours with five times their weight of a solution of 40 per cent formaldehyde together with 5 per cent of sulphuric acid and acetone, and then dried in the air, the breaking strain increased from 146 grams to 230 grams in the dry state, and from 40 grams to 105 grams in the wet state. The elasticity showed a slight decrease, but this can be avoided if the skeins are dried in a vacuum at a low temperature. Apart from their increased strength and their resistance to boiling water and alkalies, these "sthenosised" artificial silks differ from the untreated silks in their affinity towards dyestuffs, as they are only feebly dyed by the substantive colors. They may be well dyed with the various anthracene dyes by first mordanting with tannin and then with chrome alum or potash alum. The various basic dyes may be applied by means of the usual tannin and tartar emetic mordant. The action of the formaldehyde seems to be that of true combination with the cellulose of the fiber giving rise to a chemical compound which may be termed cellulose-formal.

ACTION OF DYESTUFFS ON COTTON IN VARIOUS SOLVENTS.

Dyeings have been carried out at the ordinary temperatures with solutions of Benzopurpurin 10 in mixtures of water and alcohol, and in this manner it has been demonstrated that:

(1) Cotton absorbs less dyestuffs from a mixed solvent than from either a water or alcohol solvent alone.

(2) The point of minimum absorption is reached with a mixture of 45 percent water and 55 per cent of absolute alcohol by volume.

(3) Cotton absorbs slightly less dyestuff from pure water than from absolute alcohol, and more from alcohol containing 5 per cent of water than from absolute alcohol. It is noteworthy that if silk be employed in place of cotton, the minimum absorption is attained with the same proportions of alcohol and water, and these proportions of the known hydrate of alcohol, C_2H_5OH, $3H_2O$.

When mercerized cotton was employed in the experiments different results were obtained, the point of minimum absorption being reached with a mixture of 35 per cent of water and 65 per cent of alcohol.

Methyl alcohol has practically no effect on the absorption of substantive dyestuffs by ordinary cotton, whereas mercerized cotton absorbs less dyestuff from methyl alcohol than from a solution in water.

When dyeings were made from solutions of Benzopurpurin 10B in mixtures of water and glycerine, it was found that the amount of absorption decreases as the proportion of glycerine increases.

ABSORPTION OF TANNIC ACID BY COTTON.

Recent experiments on the absorption of tannic acid by cotton have shown that the absorption of tannic acid by cotton decreases as the temperature rises. Pure tannic acid was employed in the experiments and the results are embodied in the following table:

EFFECT OF TEMPERATURE.

Condition of Temperature	Tannic Acid left in bath	Tannic Acid absorbed
Kept boiling at 212° F.	90.01 %	9.99 %
Kept at 120° F.	80.48 %	19.52 %
Steeped boiling	64.34 %	35.65 %
Kept cold	66.45 %	33.55 %

With regard to the effect of time it was found that the rate of absorption is at first very high and then rapidly diminishes, about 80 per cent of the maximum absorption being reached at the end of 5 hours. The results are tabulated as follows:

EFFECT OF TIME.

Time	Tannic Acid left in bath	Tannic Acid absorbed
30 minutes	77.32 %	22.68 %
1 hour	73.6 %	26.40 %
3 hours	63.01 %	36.99 %
4 hours	59.3 %	40.70 %
5 hours	57.63 %	42.37 %
Overnight	49.9 %	50.10 %

It was furthermore found that the amount of absorption varies with the concentration of the tannin solution. This is shown in the following table. Each bath contained 0.25 grams of tannic acid and varying amounts of water:

EFFECT OF CONCENTRATION.

Amount of Water	Tannic Acid left in bath	Tannic Acid absorbed
75 c.c. of water	46.07 %	53.93 %
150 c.c. of water	63.01 %	36.99 %
300 c.c. of water	73.67 %	26.33 %
450 c.c. of water	82.45 %	17.55 %

In these experiments on the effect of concentration of the bath it was found that there is a sort of equilibrium existing between the amount of cotton and the amount of tannic acid present. It has been previously shown by studies made by Knecht and Kershaw that cotton which has already absorbed a large quantitly of tannic acid gives out much of the tannin when steeped again in cold water. It has now been demonstrated that by treating cotton which has been steeped in tannic acid solution with boiling water all traces of the tannic acid taken up by the fiber may be removed again.

The presence of various reagents in the tannin bath seems to exert considerable influence on the amount of tannic acid absorbed by the cotton fiber. Gardner and Carter have previously shown in fact that the presence of acetic acid, citric acid, tartaric acid, sulphuric acid, hydrochloric acid, sodium acetate all have a marked effect on the quantity of tannic acid taken up by cotton. The present extension of experiments along similar lines now obtained are tabulated as follows:

EFFECT OF DIFFERENT REAGENTS.

Reagent Added	Tannic Acid left in bath	Tannic Acid absorbed
No addition	63.59 %	36.41 %
5 c.c. acetic acid	59.0 %	41.0 %
10 c.c. acetic acid	65.12 %	34.88 %
20 c.c. acetic acid	64.62 %	35.38 %
5 c.c. sulphuric acid	58.51 %	41.49 %
10 c.c. sulphuric acid	58.51 %	41.49 %
25 c.c. normal sodium chloride	60.54 %	39.46 %
100 c.c. normal sodium chloride	58.51 %	41.49 %

With regard to the amount of tannic acid absorbed by cotton from solutions of various kinds of tannins, the following tabulated results are of interest:

ABSORPTION OF VARIOUS TANNINS.

Kind of Tannin	Tannic Acid per ct.	Temp.	Tannic Acid left in bath	Tannic Acid absorbed
Tannic Acid B	92.32	Cold	60.33 %	39.67 %
		Hot	53.2 %	46.8 %
Tannic Acid A	80.97	Cold	52.88 %	47.12 %
		Hot	50.6 %	49.4 %
Galls	57.54	Cold	56.78 %	43.22 %
		Hot	54.33 %	45.67 %
Sumach	39.51	Cold	59.58 %	40.42 %
		Hot	57.23 %	42.77 %
Myrabolans	42.26	Cold	63.63 %	36.37 %
		Hot	61.76 %	38.24 %

Experiments made with reference to the fastness of basic dyes fixed with different kinds of tannin in connection with tartar emetic showed that sumach seemed to furnish a color-lake that stands the action of light much better than that of any other variety of tannin.

PERMUTITE PROCESS FOR WATER SOFTENING.

This process of water softening appears to be making great headway in England and on the Continent, and it is also being introduced into America. This process is based on the use of a substance known as "Permutite," which has the property of taking out the calcium and magnesium salts from water, replacing them with the corresponding sodium salts.

Permutite is an artificially prepared zeolite, and was discovered by Dr. Gans, professor at the Mining Academy of Berlin. A zeolite is a compound double silicate of aluminum and sodium and contains some water of hydration. Nearly all the natural zeolites, and principally a mineral known as Chabasite, possess the property of exchanging their sodium for calcium and magnesium when treated with water containing these latter salts. This property, however, is relatively slight when compared with the artificially prepared zeolite, Permutite.

Permutite is manufactured in the following manner: 3 parts of kaolin, 6 parts of sand, and 12 parts of soda are melted together. The molecular composition of the resulting silicate is given as follows: $Al_2O_3 + 10\ SiO_2 + 10\ Na_2O$. The melted mass after being leached out with water consists of an aluminum-sodium silicate, of the following composition: SiO_2, 46 per cent; Al_2O_3, 22 per cent; Na_2O, 13.6 per cent; and H_2O, 18.4 per cent.

The manufacture of Permutite does not offer any difficulty. A furnace, such as used in the manufacture of glass, is employed. As soon as the melt is cold it is crushed and washed with water to eliminate the excess of alkali. During this operation the product assumes the form under which it is sold in the market. It is then sifted and rinsed in order to eliminate fine particles; after which it is dried in centrifugal machines.

The name of Permutite was taken from the Latin "permutare"—to exchange.

The principal commercial use of Permutite is in the softening of water. Previous methods of softening water are all based on the soda-lime method. The total hardness of water, as is well known, is caused by the presence of lime and magnesia salts; the chlorides, nitrates and sulphates of these bases constitute what is known as permanent hardness, while the bicarbonates of the same bases constitute what is known as temporary hardness. If calcium hydroxide is added to a water containing bicarbonate of lime (temporary hardness), the second molecule of carbonic acid in the bicarbonate is removed, and the resulting carbonate being insoluble precipitates out of solution more or less completely according to conditions of temperature, etc. Lime-water has proved itself the cheapest reagent in practice. For each degree of hardness from 2.3 to 2.56 ounces of lime per 1,000 gallons of water are required. On the other hand, soda is used to remove permanent hardness, and in this case 2.56 ounces approximately serve to precipitate the lime and magnesia compounds from each 1,000 gallons of water per degree of hardness. Reaction begins immediately on addition of the reagents, but in practice it is found that to get the best possible removal of the hardening salts a long settling time is necessary, and also often a large excess of the reagent has to be added. Even under the best conditions, however, it is not possible to produce a water having less than 3 to 5 degrees of hardness, and besides this, the water contains excess of the precipitating alkalies.

The action of Permutite depends on its property of interchanging bases. Sodium Permutite has the formula $2\ SiO_2Al_2O_2Na_2O + 6\ H_2O$, and obviously its base is sodium. Now, in hard water, the bases are calcium and magnesium. If water of a given hardness is filtered through a bed of sodium Permutite, the sodium in the latter is replaced by the calcium and magnesium of the water, giving Calcium-Magnesium Permutite, while the acid radicles formerly united with the lime and magnesia are now combined with the sodium. Naturally, the alkalinity of the water remains exactly the same. There will obviously come a time when all the sodium in the Permutite has been replaced by lime and magnesia from the treated water. When this time arrives, however, it is not necessary to recharge the filters with fresh Permutite, but the so-called exhausted Permutite can be regenerated back to the original sodium compound. This is effected by allowing a solution of common salt to act on the exhausted Permutite. The laws of chemical exchange again come into play, the interchange in this case being in the opposite direction, the sodium from the salt taking the place of the calcium in the Permutite.

Softening plants using Permutite all deliver water of zero hardness, a result never attained by any other system. A lime-soda plant working under the best conditions with water containing not too much magnesia, it is said, can only reduce the hardness to about 3 degrees.

Another variety of Permutite is used for the removal of iron from water; this is Manganese Permutite. If a water containing 1 part of iron per 100,000 is filtered through a layer of Manganese Permutite, a filtered liquid is obtained without any trace of iron. The exhausted Permutite in this case is regenerated by treating it with a dilute solution of potassium permanganate.

One ton of Permutite is able to take 20 pounds of calcium oxide out of water.

One disadvantage of the Permutite system is that water containing any considerable amount of suspended matter soon clogs up the pores of the Permutite and renders it inactive, consequently a previous filtering of the water in such a case is necessary before it is allowed to pass through the Permutite filter.

In running a Permutite plant the loss of Permutite by mechanical removal in washing is calculated at from 1 to 3 per cent per year. As Permutite is soluble in mineral acids, if an acid water is to be operated on, it is necessary to use a layer of marble on top of the filter in order to neutralize the acid before the water comes in contact with the Permutite. Carbonic acid will also decompose the Permutite, but in case the water contains this substance, the layer of lime will also serve to neutralize it.

TENDERING OF COTTON AND LINEN BY OXALIC ACID.

Briggs, in a recent investigation into the cause of tendering of some pieces of linen cloth which had accidentally had a solution of oxalic acid spilled on them, and then left in the warehouse for a considerable length of time, has arrived at some interesting conclusions concerning the effect of oxalic acid on both linen and cotton cloth. The tender portions of the cloth reduced Fehling's solution slightly, and gave a strong acid reaction with methyl orange. On extraction with water, oxallic acid was dissolved and readily identified. Consequently it is evident that oxalic acid is capable of attacking cotton profoundly even at the ordinary temperatures, provided a sufficient length of time is given. The action seems to be somewhat similar to that of mineral acids, with the production of hydrocellulose.

In investigating the action of oxalic acid at the ordinary temperature on cotton in the presence of dextrin, Knecht (in a paper before the Seventh International Congress of Applied Chemistry) failed to obtain an oxalic ester of cellulose. He found only the evidence of a formic acid ester, and concluded that the oxalic acid had been decomposed in the fibre with the production of formic acid. Also in Knecht's experiments the cloth was not tendered. Briggs therefore took pure bleached cotton cloth and saturated it with a solution of oxalic acid, squeezed, and dried in the air. It was then heated in the dry state for several hours at various temperatures in a steam-jacketed oven. His experiments led him to the conclusion that oxalic acid when heated in the dry state with cotton even at moderate temperatures combines with it in small proportions and at the same time converts it into hydrocellulose. Evidence was also found of the formation of a cellulose oxalic ester, and this ester shows a slight tendency to hydrolyse slowly during washing. The product has a strong affinity for the basic dyes.

Australia's purchases of foreign goods increased from $184,000,000 in 1903 to $242,000,000 in 1908, $380,000,000 in 1912, and $388,000,000 in 1913. The exports from Australia advanced in value in the meantime from $235,000,000 in 1903 to $313,000,000 in 1908, and $366,000,000 in 1913.

Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.

FLYER LEAD VS. BOBBIN LEAD.

EDITOR COTTON:

I would like to give my opinion as to what causes the strain in roving when the bottom cone hesitates if the flyer-lead is used; but first let me give some credit to "Wash." He certainly makes us put on our studying caps and although we sometimes think he is in the wrong, we gain much knowledge in trying to prove him so. The problem which he has now sprung upon us is a very interesting one and although I can see through it myself, it is an exceedingly difficult matter for me to describe it. Anyone who did not have a fair knowledge of the functions of the two trains of gears that drive the bobbins and spindles of flyer-lead and bobbin-lead frames could not even make a guess at it, but at the same time if one will take the trouble to try and solve it, whether he finally succeeds or not, he will know more about fly-frames, afterwards, than he did before.

Now I think that one of the greatest evils in having the flyer lead is because of the fact that the bobbins reach their greatest velocity when full, which of course means greater wear and tear owing to the extra weight of roving the gears have to drive, while with bobbin-leading frames the speed is greatest at the commencement of a set and then gradually diminishes until the bobbins are full. Now, although I am going to try and make "Wash" come across with the root of all evil, I do not think that the strain on the roving, through any retardation of cone if the belt is fairly tight, is so great as to do much harm, and as good and as even yarn has been made from flyer-leading frames as from bobbin-lead. Also we must not forget that the bottom cone does not drive the bobbin-gears as so many men seem to think. It only varies and retards the speed of them as can easily be proved by lifting up the cone, as when doffing, and then turning the frame over a little. It will be noticed that the bobbins turn around just the same, except that the speed now equals the front roller speed, which of course coils the roving on top of the flyer, instead of winding it on the bobbin. This would be the same with either flyer or bobbin leading frames. Another evil when using flyer-lead is that if an end breaks it makes the broken end on the bobbin unwind somewhat more than does bobbin-leading frames.

My reasons why the roving is strained when the bottome cone hesitates are as follows:

In flyer-leading frames the retardation of the bottom cone, which is generally caused by the belt slipping when starting, really increases the speed of bottom cone, as the belt runs to the smaller diameter of bottom cone while slipping, but before the belt gets back to its normal position again it has got a grip on the bottom cone, which is equal to the rack being wound back a trifle towards the starting or small end of bottom cone, and this, in conjunction with the fact that the train of gears driving the flyers are fewer than the train driving the bobbins, thereby causing less backlash, are the reasons the ends tighten up a little and strain the roving.

At the particular instant when the belt, in coming to its proper position, gets a grip on the cone again it increases the speed of the cone a little too much, thus not driving the bobbins as quickly as it should and this causes them to lag behind the speed of the flyers. As "Wash" says, in the flyer-lead frame when you *decrease* the speed of the bottom cone, you *increase* the speed of the bobbins; then *increasing* the speed of bottom-cone clearly *decreases* or lessens the speed of the bobbins. The flyers start up a little before the bobbins both in flyer or bobbin-lead frames, but there is a difference in the effect. On the bobbin-leading frames it loosens the tension so that when the cone belt gets a grip after slipping it would help to tighten the ends gradually to the proper degree, but with flyer-leading frames it would strain the roving just a shade.

I will now try and explain a little more minutely what really happens when you start up a machine, before the motion is transmitted to the bottom cone. Whether the machine is bobbin-leading or flyer-leading, the motion given to the frame by main driving belt reaches the flyer before the bobbin gear commences to revolve. The action of the cone belt on the bottom cone is the same with bobbin-leading as with flyer-leading, and when the cone belt gets a grip on the bottom cone before it has reached its proper place, after running toward the thin end of cone, it equals turning the rack back slightly and tightens the ends, but it has so much slack to take up, and so much more work to overcome, owing to its having the drive the sleeve-gear against the direction of the jack shaft, that it does not strain the roving.

We will now see what takes place when we start up a flyer-leading frame. The flyer, which, as in the case of bobbin-leading, starts first, now causes the presser to wrap a small amount of roving on the bobbin which has not yet began to turn around and this fact surely tightens up the roving between the front roller and the bobbin. It is this fact, together with the action of the cone belt on the bottom cone increasing the relative speed of flyer and bobbin for a fraction of a second and also because it is not loaded as in the case of the bobbin-leading frame, as it now drives the sleeve gear in the same direction as the jack-shaft, that causes the strain in the roving.

I admit that any hesitation of the bottom cone cannot strain the roving, but it is the hesitation, or slippage of cone belt that causes it to run towards the small end of cone and by unduly increasing the speed of the cone after getting its grip, thus tightens up the ends. I hope "Wash" will not attempt to hide behind the admission I have just made, if I have given him the real reasons as to what causes the strain, as he says that every man who says the defect is there is unable to give the reason. "Wash" also says that to strain the roving the bobbin must lag behind the speed of the flyer and the only way this is possible is

by shifting the rack back towards the starting point or by having a rack gear on the frame that does not move the rack enough at every completion of the traverse. I claim the two reasons I have given both cause the bobbin to lag momentarily, while if we moved the rack back the lag would be continuous which would be the only difference in its effect. Lance (Michigan.)

SOME NOTES ON BUILDERS AND FLYERS.

I see in the August issue of COTTON where "Lance" believes I misconstrued the fourth paragraph of his article, which appeared in the February issue.

If "Lance" will refer back to this article, he will find that I copied what he stated word for word.

"Lance" began wrong from the start, when he tried to put the damper on one of the best points in the card room. He states in the February article, fourth paragraph, "In the December issue of COTTON, I see that 'Wash' wants us to believe that rubbing the end of the latches and rocker with emery cloth will remedy the trouble," and what I repeated in the June issue then follows.

In the August issue, second paragraph, "Lance" states, " 'Wash' tells us that the better method is to rub the latches at doffing time, and take the builder out on Saturday, thus proving that what I said, that rubbing them with emery cloth fixes running over temporarily, or else why would he need to take out the builder at all."

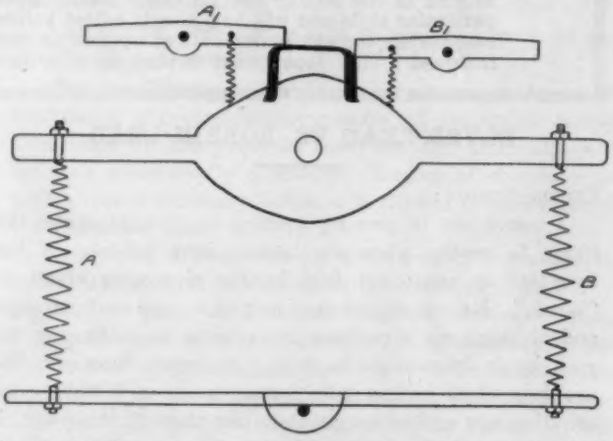
This is why. You no doubt know that the Howard and Bullough latest fly frames have the shortest taper of any make, or at least, as short as any. Now, let us assume that on Monday morning we have a frame or two running over and under. Again let us assume that the boss spinner is "hounding" us for roving. Under these circumstances would you take both builders out or would you rub them with emery cloth until Saturday, when the builder could then be taken out and properly fixed?

Rubbing the latches and rocker with emery cloth will remedy running over and under only temporarily, which is all I claimed from the start. But is it not a good point?

I aligned and erected machinery for years, and for the benefit of readers who have not, I am now going to prove something of interest about short latches.

When a builder is taken out and the rocker and latches are rounded badly, it is, of couse, necessary to file off a large amount. To make up the amount filed from both the rocker and builder, the writer saws down into the body of the rocker and inserts what is known as "steels." The shaded portion of the accompanying illustration shows the steels inserted into the body of the rocker.

I will now explain what causes the traverse to change at ¾ of the traverse, which is a common occurrence on fly frames having the type of builder shown, and as stated, is a puzzle to many. I will ask the reader to look at the illustration and picture in his mind, if he can, that the twin gear held in contact with the compound pinion by latch B_1 is set too deeply in gear. Next, hold firmly in mind that the latch B_1 and the rocker jaws on the same side are very smooth and rounded. Owing to the twin gear being set too deeply, a certain amount of vibration is conveyed to the rocker through the connecting rod. The spring B being as stated, very tight, the vibration gradually works the latch up, that is, the vibration aided by the tension of the spring B becomes stronger than the small spring that holds the latch B_1 down and engaged with the rocker before it is acted upon by the action of the poker bar and its connections. This generally occurs at about ¾ of the



traverse. In some cases, this occurs once in a set, while in other cases, it occurs every three or four layers.

No particular harm results, only the tension becomes slack owing to the number of layers missing. When it occurs every three or four layers, it becomes necessary to doff the frame. Still emery cloth will work like a charm in such cases.

"Lance" also states in his article in the August issue that "Wash's" last statement will be conceded by practical carders to be a little off. What did I state? I stated "that the man who understands the functions of a flyer, is more valuable to a card room than the man who understands the functions of a builder." I have found many carders, experts on fixing builders, who could not answer the few following questions:

Why is it that one make of flyer will hold the twist in the strand better than some other makes?

How does a poorly repaired or balanced flyer affect the compactness of the bobbin?

What will cause tension between the surface of the bobbin and the drawing rolls, instead of between the bottom of the hollow leg of the flyer and surface of the bobbin on any poorly repaired flyer?

What position should the termination of the presser finger occupy throughout the set?

How is it that a different speed will destroy the intermediate speeds or outline of the cones?

There is good dope for "Lance" and others to write about.

"Lance" also states in the August article, last paragraph, "Also when putting on a new presser be sure and file off enough of the part that runs through the two shoulders on the tubular leg of the flyer to give it as much clearance when opened, etc." If you file a little off the presser you certainly throw the flyer out of balance. Can anything be plainer? Many a man has been discharged for doing this very thing. There is only one way to repair flyers and that is to send them to the repair shop.

Wash. (Mass.)

Treat your shopmates with courtesy and work in harmony with them.

FACTS ABOUT RING TRAVELERS.

EDITOR COTTON:

While working in a northern mill, I found it hard for some twisters to run good and also to start well in the morning and at noon, the cause being that when a few frames were started at either morning or noon the ends would break on these certain machines, that is, at least three-fourths of the ends on each side would be down when they were started up.

Although the machinery was not new, I could find no fault with the settings of each twister, and therefore concluded the trouble must be from the ring rails up, so I investigated the amount of water the twister-tenders were putting in the troughs, and found they always had them full to the top. I then went to the frame that would break the most at starting and removed about half of the amount of water in the trough on one side only. Then I had the doffer doff this certain frame and started it up.

Some men allow the twister tenders to oil up, with the frame stopped, which was the custom with these under consideration. But as I wanted to find out what was the cause of these certain frames breaking down at starting time, I did not allow the attendant to oil the rings until the machine was started up. How many overseers who have charge of twisters have seen, while the frame is stopped, either for doffing or at noon hour, the way the travelers are coated with cotton, or as we might call it, waste? Although in small quantities, it would, after it had dried, hold the travelers fast to the ring plate.

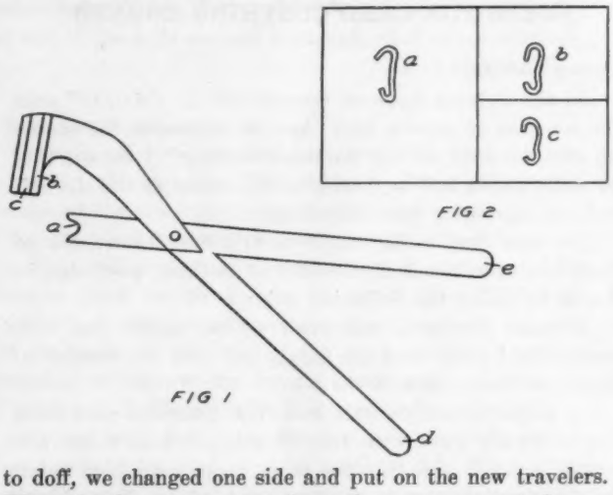
Oiling the frame when stopped is a poor practice, because it not only keeps the frames stopped five or ten minutes longer at each doff, which means a great loss of production at the end of the week, but it only keeps the plate and the top of the traveler wet with oil for a few minutes. As the frame is started the traveler becomes somewhat dry, also the ring and plate, therefore we can see that this helps in causing some ends to break down at starting time, also while the plate is wet with the oil, dust adheres to it and makes the traveler run heavy, whereas, when a twister-tender oils up with the frame in motion he gets better results.

The doffer doffs the frame, after which he starts it up. After piecing up the broken ends he goes in search of another frame to doff. The twister-tender takes his oil can brush and starts oiling. As the travelers run at a very fast rate, the attendant, while oiling, first touches the travelers with the brush, which means that besides oiling them he is keeping them clean at the same time, therefore obtaining better results, and not keeping the plate full of oil as in the former case, thus allowing very little for the cotton to adhere to the plates and travelers. Then, too, when the trough is full of water, the ends, as they go through it bring some of that water down as far as the plate, where with the speed of the traveler it is squeezed out of the yarn as we may say, thus falling on the ring plates, and on the floor. This depends somewhat on the counts of the yarn; coarse counts bring down more than fine counts, therefore the water that drops on the plates or rings interferes with the good running of the travelers, because with water on the rings the travelers run heavy and break with the strain.

After a few days of constant watch over this certain frame at starting time, I was not satisfied with the way it would start up either morning or noon, although not breaking as usual at starting time, I could see that something else should be done to reduce the amount down to ten broken ends, which I knew could be done. As I have stated before, the settings were correct, and all the rails level, so the trouble was with the travelers. Now, with the troughs full of water some frames run very bad, such as those running coarse numbers; those running fine numbers should have the yarn all under water, or in other words, the trough full, as fine yarns run slow, nine times out of ten, and draw very little or no water down with them, whereas with coarse numbers it is the opposite.

I was buying travelers from a certain firm which had supplied me with travelers for a number of years, so I decided to send for one of their representatives, to see if he could not help me stop the breaking of ends at starting time. When he arrived I showed him the way the travelers worked at starting time, and after a talk, I gave him a ring to go by and also a few sizes of travelers, of which I asked to have him send me samples.

A few days later I received a box of No. 17½ travelers, which I used on 60's yarn. As soon as the frame stopped



to doff, we changed one side and put on the new travelers. When the frame was started up, there was a great change, as only two ends had broken down. This pleased me very much, so I changed the other side and before the week was over I had all of the 60's yarn equipped with the sample travelers, and was getting good results as far as starting up was concerned. I also noticed that they did not get coated with cotton as soon as the other kind of travelers did, thus running more lightly.

The one fault I found with these samples was that when the rails were washed, they would fall off by the dozens, so I sent up another ring and had them make me one hundred travelers just the way I wanted them, and when I had them put on the frame they were found very hard to go on, but when the machine was started they proved to be better than the first set of samples, and when the rails were washed, not one fell off.

After this I insisted upon being supplied with these special travelers. The frames that once would break considerably at starting, are now running O. K., and the twister-tenders are all pleased because it takes but a few minutes to straighten out, whereas before it would take a long time. I also had a few pinchers made, to put these travelers on, which are shown, together with the shapes of the travelers mentioned.

Fig. 1 shows the kind of pinchers I had made in the

machine shop. It is a simple but useful tool. The groove (a) is where the edge of the ring plate sets in, thus affording a better hold on the pinchers, making the travelers slip in easy without bending them, which is accomplished by a slight movement of the end (d) upwards, which results in the part (b) being brought down against the traveler on the inside of the ring, thus snapping it into place. The groove (c) is, in case of small rings, so it will fit against the spindles. The other end (e) is held in the same position throughout the operation.

Coming to the travelers we have three shapes: Fig. 2 (a) are the ones I had that would cause so many ends to break at starting time, note the shape; (b) represents a style they sent me, but which were sent back on account of them hugging the plate and eating a groove all the way round the ring, and (c) shows the kind I had them make me, which proved satisfactory and are what is being used at this writing. It can be seen that in (c) the tips of the traveler are a bit shorter than in (b), thus allowing it to run free around the ring and still not fall off when the rails are washed. Tab. (Mass.)

RULES FOR CARD CLOTHING COUNTS.

EDITOR COTTON:

In the October issue of COTTON "D. J. (Maine)" asks for someone to inform him "how to determine the counts of wire for twill set top flat card clothing." I take it that he really means how to determine the counts of the clothing and am answering him accordingly.

An easy way to do this is to first find the number of teeth per square inch in the fillet or clothing which can be found by using the following rule:

Crowns per inch, multiplied by the noggs per inch, multiplied by the teeth per nogg, will give the number of teeth per square inch in the fillet.

It might be well to state here that American card clothing is usually made with four crowns per inch unless otherwise ordered and that the term, nogg, used here refers to the distance between the first tooth of one line of twill and the first tooth of the next line of twill. The following example will serve to illustrate the foregoing rule:

Example: Find the number of teeth per square inch in a sample of card clothing, the crowns per inch being 4, teeth per nogg, 6, and the noggs per inch, 8. Solution: 4 crowns per inch $\times$ 8 noggs per inch $=$ 32 $\times$ 6 teeth per nogg $=$ 192 teeth per square inch.

Having found the teeth per inch it is then an easy matter to find the counts of the clothing by using the following rule:

The number of teeth per square inch divided by 2.5 (2½) *equals the counts of the clothing.*

Going back to the previous example we found that we had 192 teeth per square inch in the given sample hence 192 $\div$ 2.5 $=$ 77's $=$ counts of the clothing.

Perhaps an easier way of stating these rules would be to put the two into one and by doing so we get the following:

The number of crowns per inch wide, multiplied by the number of crowns per inch long and the result divided by 2.5 *will give the counts of the clothing.*

Referring again to the example previously cited, we see that we had 8 noggs per inch and 6 teeth or crowns per nogg so that there are 48 crowns per inch long. Hence:

48 $\times$ 4 $\div$ 2.5 $=$ 77s $=$ counts of the clothing, which is the same result that was obtained in the first instance.

"Windy" (N. C.)

METALLIC ROLLS AND COMMON ROLLS.

EDITOR COTTON:

In the October, 1914, issue of COTTON there appears an article on metallic rolls which contains many statements that I think should be criticised.

The first statement made that I should criticise is the definition of drafting. It says, "Drafting means pulling the fibres past one another." When I first read that statement it brought to mind another I had read in the practical problem department of COTTON referring to a machine then much talked about employing a draft of 70 or thereabout and planned to do away with all fly frames and spin yarn direct from the sliver. This writer spoke of the apparent impossibility of pulling fibres past 70 others and thereby pronounced the machine a failure.

The two statements are very similar. Drafting, or the application of draft to a strand or sliver, or a number of slivers causes the sliver to be elongated. This is accompanied by a corresponding reduction in the weight per yard. This elongation is brought about by drawing the fibres away from the mass causing them to be redistributed in the strand. In this redistribution no one fibre is pulled past another. It is a simple case of "first come, first served." The fibres first grasped by the roll are drawn away from the others. So long as the drawing continues to be regular, so long will we get a regular and evenly finished sliver. Any hesitation in the drawing action, or in the feeding of the sliver to the drawing rolls, will upset the even and regular redistribution of the fibres and cause an uneven sliver.

Further on in the article we read that "For this reason also on a 16-pitch roll the diameter of the collars is .07 inch less than the diameter of the fluted section and as both rolls are the same, the amount of overlap is .07 inch." Now stop and consider this statement. Both rolls are the same, and the difference in diameters is .07 inch. This gives .14 inch overlap and not .07 inch.

Referring to the diagram of gearing accompanying this article I assume from the text that this is a diagram of a frame geared for common rolls. Now consider this diagram. How are the rolls going to be set on this frame for 1 inch American cotton? It is impossible to set them. Again the writer says that the draft between the front and second rolls is 2.584. From the diagram this draft figures 1.66. The draft between the second rolls figures 2.72 and not 1.753.

And then the writer says it is possible to, and even necessary to run this frame with what he calls a draft of .966 between the calender rolls and front roll. In the first place there is no such a thing as a draft of one or less than one. This is not drafting. It is directly the opposite. Would the writer have the readers of COTTON believe that for every 100 inches of web delivered by the front roll only 96.9 inches go into the can? What becomes of the other 3.1 inches? And does he mean to tell us that he actually ran this frame this way and made the ends stay up by using this so-called draft? What did he do with the 3.1 inches lost somewhere between the front and calender

roll? If the frame ran and the ends stayed up between the front roll and calender roll then there must have actually been a slippage of at least 3.1 per cent and probably a little more between the front bottom steel roll and top leather roll. If so, there actually was a draft of over 1 between the calender rolls and front roll. If this condition existed then the fault was with someone or something other than the leather rolls.

Again the writer tells us that a "1⅛ inch diameter roll, 32 pitch should be figured 18/6." This means that a 32 pitch roll, 1⅛ inches diameter, assumes a working diameter of 3 inches when running, owing to the crimping effect of the meshing of the flutes. This is away off as all practical carders know.

For every process of manufacture under given conditions there is one best method of procedure and only one. To advance metal rolls as a "cure-all" seems to me to be absurd in the light of personal experiences. I have run 540 deliveries of drawing fitted with metallic rolls at a speed of 500 revolutions per minute and run them successfully, but I had to have better than 24 pounds on the front roll. I had 32 pounds total weight on the front roll and had to have it to get the desired results. On the second was a total of 36 pounds, on the third a total of 42 pounds, and on the fourth a total of 42 pounds. To have run leather rolls under these conditions would have been impossible. I have also run leather rolls in this same mill successfully under different conditions, also in this same mill a combination frame with the two back lines of rolls metallic and the two front lines common rolls.

Today I am running leather covered rolls on 1⅞ inch, 1⅝ inch, 1⅜ inch and 1⅛ inch stock and getting results that cannot be obtained with metallic rolls. How do I know? Because we have tried them. They gave fair results but leather gave still better results. I am running 6 ends up of 50 grains each and drafting just 6 for a total on the breaker and 6 on the finished drawing, producing a 50 grain finished sliver. These frames are actually drafting 6 in each case for they have draft gears that give a figured draft of that amount. I am using 59 calender roll gears and have a draft of 1.03 between the calender and front rolls, figured and actual. I have changed this gear from a 59 to a 60 and increased the weight of the six ends 5 grains; that is from 300 grains to 305 grains. If I put on a 61 calender roll gear the ends will run slack between the calender rolls and the front roll.

If there is not positive draft with leather rolls I fail to see where positive draft can be obtained with metallic rolls. I am not yet ready to admit it is necessary for me to run a so-called draft of less than one on my drawings fitted with leather rolls.

I have twice had occasion to make a 250 grain sliver for the woolen trade, once with metallic rolls and once with common rolls. In both instances the sliver produced was satisfactory to the people buying it. The drafts in each case were practically the same. In one case a 55 grain card sliver was used and in the other a 60 grain sliver. Both were finished to 250 grains on two processes of drawing. In comparing the slivers the one produced with the common rolls had the best appearance. The sliver appeared smoother and the individuality of the slivers fed at the back of the finisher drawing were completely lost in the finished sliver. In the sliver I had made with metallic rolls this one point seemed impossible to overcome. The individuality of the slivers fed appeared in the finished sliver although I tried in many ways to overcome it.

I am not arguing now that leather rolls are better than metallic rolls. There are some cases where I would have only metallic rolls if I was to buy them; and there are cases where I would have leather rolls. Each is suited to certain conditions and under these conditions will prove of advantage over the other type. But I cannot admit that I think metallic rolls are better in every case.

H. C. W. (Mass.)

THE CAUSE OF FLUTED ROLLS.

EDITOR COTTON:

Replying to the question of "Beginner," (Georgia), as to why rolls and shells flute, will say that it is because each roll is the same size, i. e., the leather roll and the steel are of the same diameter. This causes the flutes in the steel roll to travel in the same path and press the leather at the same place each time, which of necessity flutes the leather roll. This is more noticeable with heavy roll weighting and if the rolls are not kept well oiled at the bearings.

K. (Alabama.)

EDITOR COTTON:

There are various reasons for fluted rolls and in order to explain this question thoroughly we must discuss the passage of the stock and the duty of the top rolls.

As the stock passes from the back roll to the middle roll, the middle roll has a double duty to perform: first, it has to draw the stock from the back roll. This draft is very slight but still there is a draft; second, it must hold the stock, or the bulk of the stock, while it is being attenuated or drawn out by the front roll. Therefore, the roving as it passes under the back and middle rolls is of a larger bulk and holds the top rolls to some extent from coming into such a close contact with the bottom steel rolls, while they are at the same time revolving much slower than the front roll. But as the stock passes under the front rollers it is much lighter, owing to the drawing taking place. Therefore, the front top roller is allowed to come into closer proximity to the bottom steel roller than in the case of the two back rollers. There being practically nothing to hold them apart they are inclined to "flute" more than the middle and back rollers.

With this in view it can readily be seen that with too much weight on the front roll it will cause the leather coverings to sink into the flutes of the bottom steel rolls. To prove this assertion it will be found that the majority of "fluting" takes place on counts ranging from ones to twenties, and on warp wind. Why is this? Because owing to the heavier or more bulky stock required for the numbers, the machine builders have decided that the rolls must be weighted heavier than with lighter counts. This reasoning holds good to a certain extent, but it is like everything else, it can be overdone and is, quite often.

In my opinion there are many frames in operation today that could be run with much less weight without any damage to the quality of the yarn and a great saving in power consumption. 99 per cent. of my fluted rolls have been caused by too much weight on the front roll.

I would advise "Beginner" to try the following method

and I believe it will do away with the majority of his trouble. First, cut a piece of note paper about a half an inch wide. Break the roving back on one end then stop the frame, unsaddle the roller where the roving was broken back and place the paper on the front steel roller and let it extend to the middle, or across the middle roller, then put the top rolls back in place, saddle them up and press downward on the weight lever firmly for a few seconds. Remove the rollers and paper and by looking closely at the paper he will notice the imprints of the front roller and the middle roller on the paper. This, when measured by a rule will show him just the exact distance from bite to bite of his rollers. Now measure the length of the staple of cotton in use, and space the rollers one-sixteenth of an inch further from bite to bite of the rollers than the length of the staple of cotton. I recommend this in order to get an even draft without any strain on the staple, or to reduce the amount of strain to a minimum.

When the draft is thus regulated and the rolls are not drawing too much, it it will be no trouble to get some of the weight off of the rollers. By making this setting on an entire side, and getting lighter weight for an entire side, "Beginner" can experiment until he finds the exact weight needed for his purpose. Try this and let us have the result through COTTON.

Another thing which will cause shell rolls to flute is not getting them paired, that is the one on one end of the arbor being larger than the one on the other end. Also if the arbor becomes dry and rusty they will flute on the account of being so hard to revolve. However, there is but very little of this. And after the whole trouble has been thoroughly gone over it will be found that excessive weight is the greatest trouble.

Overseer (Ala.)

EDITOR COTTON:

In the October issue of COTTON "Beginner (Georgia)" asks for someone to write something about the cause of "fluting" on spinning rolls and shells, and I will endeavor to enumerate some of the causes that have come under my personal observation.

If the leather top roll or shell is the same size as the fluted bottom roller, the top one will almost invariably "flute." In making this statement I have not failed to take into consideration the fact that the fluted bottom rollers are generally made with the flutes unevenly spaced; that is, the distance between two flutes in one place is different from the distance between two flutes in another part of the same roll. This uneven spacing is resorted to as a means of preventing the "fluting" of the top rolls or shells and will do so provided the top roll is of a different size from the bottom one, as is the case on a great many frames. When they are of a different size the flutes of the bottom roller will strike the circumference of the top roll at a different place during each revolution. However, if the two rollers are of exactly the same size it can readily be seen that even though the flutes are unevenly spaced they will strike the leather roll or shell in exactly the same place each revolution, and soon cause the roll to "flute."

I have worked at a mill where they were using some old-style spinning frames that had the top and bottom rolls the same size, and it was not an uncommon occurrence to see two or three dozen shells on a side more or less fluted, and I have seen a shell "flute" almost immediately after being put onto the arbor and started up. It is needless to say that the roller shop bill at that mill was a good deal in excess of what it should have been and that those frames have now been discarded.

We often have to make the best out of conditions as we find them and the trouble can often be a great deal benefited by using roller cloth in covering the rolls on shells of such a thickness as to make the rolls or shells of a slightly different size. I would advise "Beginner" to ascertain if this is the trouble on his spinning frames, and if he finds such to be the case to instruct his roller-shop man to use roller cloth of either a little thinner or thicker kind, and I think his trouble will be at least partially eliminated.

Often a shell will "flute" because it is dry for want of oil. When they become dry they will tend to run slow or drag, thus becoming harder to pull and the bottom roller will flute them. It is a good idea to swab out each shell and then dip the arbor into non-fluid oil before putting them on the frame and then have them picked and oiled regularly. On coarse work the rolls should be picked twice a week, while on fine work once a week will be sufficient. Tell your spinners they are to pick their rollers twice a week, on Tuesday and Thursday, for instance, and have the oiler oil them as they are picked, and then see that they do as they are instructed.

Another thing that frequently causes "fluting" is loose cots. It is better to burst a cot occasionally by putting them on tight than to put them on loose. If the cots are put on loose, the flutes will sink or penetrate more easily into the top roll or shell and the continual sinking in of the flutes will cause fluting. Loose cots also cause a great deal of bad work and uneven yarn. There are other causes, such as bad work at rollershop by using poor skins and faulty cushions, also hard ends or lapups on doubleboss rollers. "Windy," (North Carolina.)

FIGURING WARP CONTRACTION.

EDITOR COTTON:

I would like to have some of the contributors to the Practical Discussion Department of your magazine advise through its columns which is the correct method to use to calculate the length of warp for a given length of cloth using the following length of cloth for an illustration: 37 inch, 48 x 48, 4 yard goods, 63 yards per cut.

Is 63 yards, the length of the cloth, considered as 100 per cent in making the calculation, or, if you add 8 per cent for contraction, would it be considered 92 per cent? In other words if 63 yards is considered 100 per cent and you add 8 per cent you would add 5.04 yards and make the warp 68 yards long. But if 63 yards is considered 92 per cent would you add 6.84 yards and make the warp 70 yards long.

Red. (Georgia.)

The general increase in Chinese cotton goods imports in 1913 was due to the greater prosperity because of the abundant harvest. American trade, however, suffered in both jeans and sheetings. The Japanese have advanced in sheetings at the expense of the United States and in jeans at the expense of Great Britain. Gunny bags are imported from Calcutta.

Notes About Men You Know.

H. O. BALL, superintendent of the Pepperton Cotton Mills at Jackson, Ga., had an interesting business trip to New York City during the past month.

J. Y. JONES, overseer of spinning at the Newberry, (S. C.) Cotton Mills is working for a free trip to the Panama Pacific Exposition to be held in San Francisco next year. If you read the popular magazines tell him about it.

LEON BARRETT, recently with the Stark Mills, Manchester, N. H., is now boss carder for the Indian Orchard Co., cotton yarn spinners, at Indian Orchard, Mass.

GEORGE L. CARRIGAN has accepted a position with the Manhassett Mfg. Co., manufacturers of automobile tire fabrics, at Putnam, Conn. This company is operating night and day and is adding new card room machinery.

R. S. REINHARDT, president and treasurer of the Elm Grove Cotton Mills of Lincolnton, N. C., recently spent some days looking over the situation in the New York cotton market.

B. J. FISHER, superintendent of the Merrimack Manufacturing Company of Huntsville, Ala., has organized the Boy Scouts at that place and has quite a la[illegible] company of them. They drill three times a week and are doing nicely.

H. N. HOWARD, who has been secretary and treasurer of the Dixie Cotton Mill, of Mooresville, N. C., since its organization six or seven years ago, has resigned. E. W. Brawley is filling the position of secretary and treasurer temporarily.

FRANK W. GURRY, formerly superintendent of the Nottingham Mills of the B. B. & R. Knight Co., at Providence, R. I., is now general manager of the Postex Cotton Mills, of Post City, Texas.

J. B. GREER has been appointed assistant manager of the Gault Mfg. Co., of Union, S. C.

W. G. REYNOLDS has been promoted to general superintendent of the Dresden, Lumberton, and Jennings Mills, of Lumberton, N. C.

GEO. BUSHER, of New York State, has accepted the position of overseer of spinning at the Marlboro Mills No. 5, McColl, S. C.

H. ARTHUR LIGON, JR., has been elected vice-president and assistant treasurer of the Arcadia (S. C.) Mills.

J. B. MEACHUM has resigned as superintendent of the Buck Creek Cotton Mills, Siluria, Ala., and will succeed Geo. F. Brietz, as superintendent of the Kinston (N. C.) Cotton Mills.

W. A. SKIDMORE of Charlotte, N. C., has accepted the position of superintendent of the Dillon Mills at Hamer, S. C., of which G. D. Barlow of Dillon, S. C., is general superintendent.

J. H. PRESCOTT, formerly of the Allentown (Pa.) Eiderdown Co., has accepted a position as boss knitter with the Cheltenham Knitting Co., at Germantown, Pa.

C. T. FALLIN is now in charge of the cloth room of mill No. 1 at Kannapolis, N. C.

B. W. BINGHAM has accepted the position as overseer of carding and spinning at the Atlanta (Ga.) Woolen Mills.

F. C. HALL, assistant superintendent of Dan River Mills Nos. 3 and 4, succeeds W. A. Hope as assistant superintendent over all the carding and spinning at Schoolfield, Va.

S. R. POWER has accepted the position of overseer of weaving at the Gaffney (S. C.) Mfg. Co.

C. H. GOODROE has been elected general manager of the Yazoo Yarn Mill, Yazoo City, Miss.

ARCHIE WEST, who has been overseer of the short chain beaming and drawing-in at the Locke Cotton Mills in Concord, has been transferred to the office as designer for the plant. J. C. Cook, overseer of long chain beaming and slashing, has been made overseer of the department which has been in charge of Mr. West.

D. T. JUY has become overseer of the cloth room at the Stonewall (Miss.) Cotton Mills.

WILLIAM WARMACK has been elected president of the Yazoo Yarn Mill, Yazoo City, Miss.

CHERRY L. EMERSON of the Charlotte office of the Westinghouse Electric Co., is to be married on November 11th to Miss Sina White of Atlanta.

AB TATUM has accepted the position of overseer of twisting at the La Grange (Ga.) Mill.

FRANKLIN W. HOBBS, president of the Arlington Mills, Lawrence, Mass., has been succeeded as trustee of the Lowell Textile School by Dr. John T. Donehue, the latter having been appointed by Governor Walsh, of Massachusetts.

ALBERT F. BEMIS, president of the Bemis Bros. Bag Co., Boston, Mass., has been elected a life member or the corporation of the Massachusetts Institute of Technology, succeeding the late Eben S. Draper. Mr. Bemis was graduated from the institute in 1893 and is a past president of the M. I. T. Alumni Association.

R. G. ADAMS has accepted a position as overseer of weaving with the Echota Cotton Mill, Calhoun, Ga.

CHESTER I. CAMPBELL, the noted exposition manager, after much urging by a committee of prominent citizens has decided to be a candidate for the Republican nomination for mayor of Quincy, Mass. The committee, which was made up of men of the various political parties, urged him to seek the nomination, as they felt that he would be an easy winner.

E. P. LEE of Dillon, S. C., has accepted the position of assistant superintendent of the Dillon Mills at Hamer, S. C.

R. S. STEELE has accepted the position of assistant secretary and treasurer of the LaFayette (Ga.) Cotton Mills.

ROBERT A. S. REOCH has been placed in charge of the entire print works department of the Pacific Mills at Lawrence, Mass. He was formerly superintendent of the Cocheco print works of this company.

LEWIS M. CARPENTER has been appointed assistant to A. R. Young, superintendent of the Ashland Cotton Co., at Jewett City, Conn.

B. T. CHEEK has been elected president of the Lavonia (Ga.) Cotton Mills.

WILLIAM H. CARTER, general manager for the William Carter Co., underwear, has defeated Nathaniel Francis, of

Brookline, Mass., for the Republican nomination for Congress from the 13th District.

L. A. KING has resigned his position at the Maple Mills, Dillon, S. C., to become overseer of winding at the Lumberton (N. C.) Mill.

HARRY J. RICKETSON, agent of the Suncook Mills, has resigned his position to accept a position as agent of the Butler Mills at New Bedford, Mass., succeeding Louis R. Kerr.

At a meeting of the directors of the Newnan Cotton Mills, F. COLE, general manager of the R. D. Cole manufacturing Co., was elected president of the corporation, succeeding the late Peter B. Murphey, whose death was recently noted. Judge R. W. Freeman was elected vice-president, and Roy N. Cole was chosen to fill a vacancy on the board of directors. The Newnan Cotton Mills is a half-million-dollar corporation. Fully 90 per cent of the stock is owned by home people.

JOSEPH CHEETHAM, formerly in the weaving department of the Davol Mills, Fall River, has been appointed assistant superintendent of the Durfee Mills of the same city. He succeeds Richard H. Fish, who was recently appointed superintendent of the Arkwright Mills of Fall River.

RAYMOND H. BREWER, of East Hartford, has taken charge of the welfare work planned by the Shetucket Co., Greenville, Conn., manufacturers of denims and tickings. On October 15, the welfare department took quarters in the remodeled storehouse at North Main and Third Streets where it has a class room, 29 feet by 46 feet; pool and game rooms, reading room and music room; baths for men and women, and a reception hall.

THOMAS E. FITZMAURICE, superintendent of the Paramount Knitting Co.'s plant at Beaver Dam, Wisconsin, was married recently to Miss Madelon Malone, daughter of Mr. and Mrs. James E. Malone, of Beaver Dam.

RICHARD BATEMAN has accepted a position of superintendent of the Newmarket Manufacturing Co., of Newmarket, N. H. He was formerly employed in the weaving department of the Manville Co., at Manville, R. I.

FREDERICK E. TWISS, paymaster at the Everett Mills, Lawrence, Mass., underwent a surgical operation at the Barr Sanatorium recently. He is reported to be rapidly improving.

CHARLES B. LUTHER, treasurer of the Luther Manufacturing Co., Fall River, Mass., has been elected permanent treasurer of the Stafford Mills.

A. G. PATTERSON, overseer of spinning at the Globe Mfg. Co., Gaffney, S. C., has also taken charge of the carding.

FREDERICK BATCHELLER, superintendent of the Pacific Mills, Lawrence, Mass., is taking a few weeks' vacation at Bridgeton, Me.

C. B. BUCHANAN has resigned as overseer of weave rooms Nos. 2 and 5 at the Eagle & Phoenix Mills, Columbus, Ga., to become overseer of weaving at Stonewall (Miss.) Cotton Mills.

DAVID H. PIETTE, overseer of carding at one time for the Whittenton Mills, Taunton, and later with the Tremont and Suffolk Mills, Lowell, in a similar capacity, is now connected with the Centreville Manufacturing Co., Centreville, R. I.

W. E. TISDALE has accepted the position of overseer of carding at Deep River Mills No. 2, Randleman, N. C.

CHARLES O'GARA, formerly superintendent of the Slater Mill, Pawtucket, R. I., is now filling the position of superintendent of the Nemasket Mills, Middleboro, Mass.

W. H. HARDEMAN, overseer of weaving at the Newberry (S. C.) Cotton Mill, won a free trip and all expenses paid to the world series baseball games in the contest conducted by the Columbia Record. He got 1,650,690 votes.

W. M. CRUMP has resigned as superintendent of the Warrenton (N. C.) Cotton Mill to accept a similar position at the Cabarrus Mill at Concord, N. C.

L. O. BUNTON, formerly overseer of weaving at the Wylie Mills, Chester, S. C., is now overseer of cloth room at Ware Shoals, S. C.

W. J. TALLENT has changed from overseer of carding for the Holston Mfg. Co., Lenoir City, Tenn., to night superintendent for the Prendergast Cotton Mill, Prendergast, Tenn.

JAMES L. SEXTON, formerly manager and principal owner of the Charlotte (N. C.) Cordage Co., has accepted a position with the Mallison Braided Cord Co., Athens, Ga.

W. T. JONES has been promoted from second hand in spinning to overseer of carding and spinning at the Social Circle (Ga.) Cotton Mills.

JOHN M. WILLIAMS, W. C. HORTON and LEE S. RADFORD, all of Winder, Ga., contemplate leasing and operating the Lawrenceville (Ga.) Cotton Mills, owned by Filer & Stowell Co., Milwaukee, Wis. Prospective lessees now operate a cotton mill at Winder.

HARRY L. WILLIAMS, president of the Swift Manufacturing Co., Columbus, Ga., has just completed a $100,000 home in Wynnton, one of the fashionable suburbs of that city.

MARSHALL DILLING has been transferred from the superintendency of the Cabarrus Cotton Mills at Concord, N. C., to a similar position with the Buck Creek Cotton Mills, of Siluria, Ala. Both these mills are under the management of the Cannon chain of mills. Mr. Dilling is treasurer of the Southern Textile Association.

J. H. GARRETT has resigned as overseer of carding at the Elizabeth City (N. C.) Cotton Mills to accept a similar position at the Profile Mill No. 1, Jacksonville, Ala.

E. K. DAVIS has succeeded B. F. Barns, Jr., as assistant purchasing agent for the Fulton Bag and Cotton Mills, Atlanta, Ga.

JAMES CREE has resigned his position with the Danielson Cotton Co. to accept the position of overseer of weaving with the Hathaway Manufacturing Co. of New Bedford. Mr. Cree was in the employ of the Dartmouth and Nashewena mills of New Bedford for more than 11 years.

ANGUS GARRETT has taken up his new duties as superintendent of the New England Knitting Co., Winsted, Conn., having been recently appointed to that position, succeeding Edwin Hitchcock, whose death occurred recently.

HARRY L. BAILEY, general manager of Wellington Sears & Co., is spending some time at Anderson, S. C., in connection with the Equinox Mills.

J. H. GAULT, president of the Gault Mfg. Co., Union, S. C., will hereafter be general manager of the Chattanooga Knitting Mills, Chattanooga, Tenn., the Richmond Hosiery Mills, Rossville, Ga., and two smaller knitting mills.

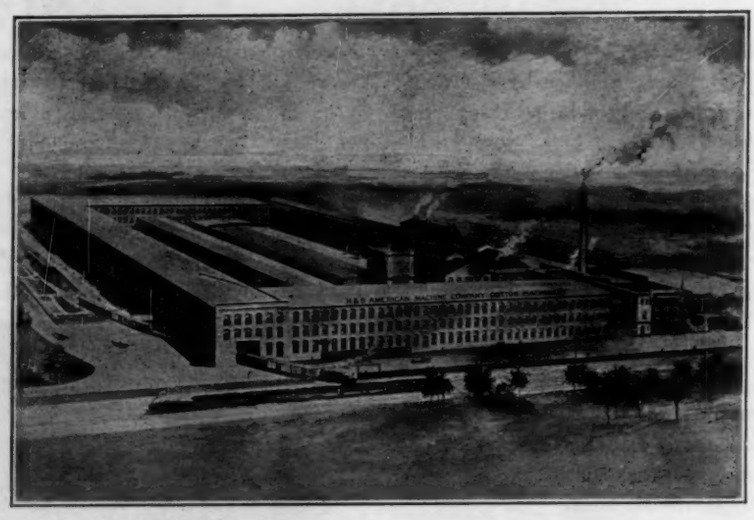
C. E. RILEY, Pres.
Boston Office
65 Franklin Street

Southern Offices
814-815 Empire Bldg.,
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY
PAWTUCKET, R. I.

New Machinery and Trade Notes.

Made in Columbia.

The Columbia State published recently a special feature edition devoted to Columbia and South Carolina in 1914. The paper consisted of 88 pages and was printed in six sections. Thirty thousand pounds of white paper were used in the edition; the total number of pages printed was 2,094,400. If these pages were laid end to end they would cover a distance of 380 miles, which is quite a little bit of paper.

Mechanically this issue was peculiarly a home product; the cover page was the work of *The State's* own artist, nearly all of the cuts, both in the advertisements and in the news columns, were made in *The State's* own engraving plant, the covers for the bound copies were printed in *The State's* job office, and the binding was done in *The State's* book bindery, Every line of special matter, both reading matter and advertisements, was set in *The State* office, and the entire edition was printed on *The State's* four deck Hoe press. The issue showed many interesting facts about South Carolina, and reflects something of the progress the state has made during the past year. It was also a worthy and representative illustration of South Carolina newspaper enterprise.

A Friendship Folder.

THE GRATON & KNIGHT MANUFACTURING COMPANY, Worcester, Mass., has recently published a good will builder in the form of a folder of unusual merit. This folder, which has a color scheme in golden brown, shows oak leaves and acorns, corn shocks and "punkins," while country dinners, husking bees and songs around the parlor organ are delightfully brought out by the illustrations, which are intended to bring back to the memory of the reader the boyhood scenes of American rural life. It is a folder which will revive pleasant memories in the minds of the thousands of readers who receive it.

THE LINK BELT COMPANY, Chicago, Ill., have recently issued their book No. 190 entitled "Link-belt Wagon and Truck Loaders." This book, which is 6x9 inches in size, contains 32 pages of very interesting illustrations and descriptions of regular and special loaders manufactured by this company for a variety of purchasers. A copy of this book may no doubt be secured on application to the company.

Texas factories use only one bale of cotton out of every 100 produced.

35th Anniversary of Electric Lighting.

Wednesday, October 21st, commemorated the 35th anniversary of the invention of the electric incandescent lamp by Thomas A. Edison. This day in 1879 may be said, broadly speaking, to mark the birth of electric lighting. Certainly it marked the birth of the general and popular use of electric lamps. Arc lamps had been in use some years previous to this time, but the universal lighting of public buildings as well as private dwellings by electricity through units became a dream only when Edison first successfully made his electric filament bulb glow in his laboratory at Menlo Park, N. J., thirty-five years ago.

It was particularly appropriate that this day should be known as "Edison Day," because it not only did honor to the inventor of the electric incandescent lamp, but was also the anniversary of the first big millstone in the manufacture of incandescent lamps. In 1880 an employe of the Edison factory carried all the electric incandescent lamps in the world from Menlo Park to New York City in a market basket on his arm. A year later it was considered a wonderful feat when the small factory turned out a thousand lamps a day. Today the great Edison lamp factory at Harrison turns out 35,000 lamps an hour.

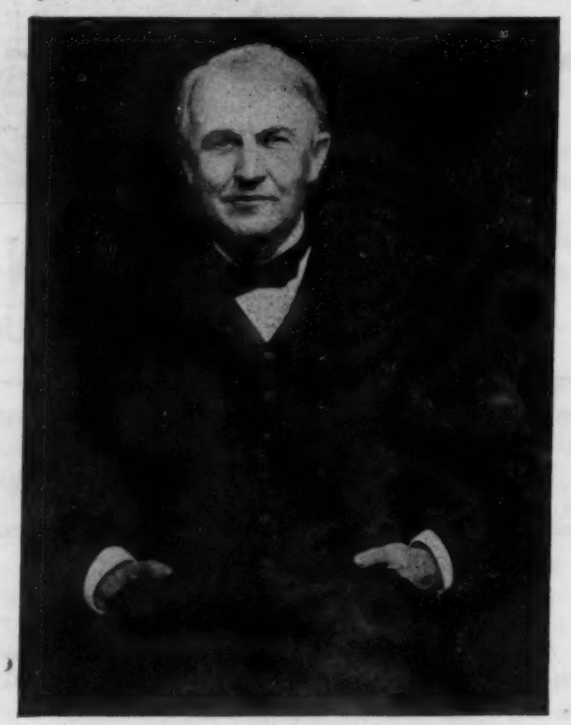
"It is true, Edison never went to any college, but he knows more about the subjects taught in colleges than most college men," said Dr. Charles Proteus Steinmetz, the wizard of electricity and chief consulting engineer of the General Electric Company, in giving the essence of his appreciation of Mr. Edison in honor of this thirty-fifth anniversary of his invention of the incandescent lamp. "Whether you talk with him about electrical engineering or other engineering, organic chemistry or anthropology, or any other subject, you always find him fully familiar with the subject and able to give you valuable hints for solving your difficulties. From my experience I consider Edison today as the man best informed in all fields of human knowledge."

We are all more or less familiar with the events of the romantic life story of Thomas A. Edison, the boy who only really went to public school three months, was given up by his teachers in despair because he was always at the foot of the class, was taught by his mother, installed a "laboratory" in the cellar of his home, started in business as a newsboy on trains of the Grand Trunk to get money for scientific books and equipment for his "laboratory," installed another "laboratory" in the baggage car of the train and was thrown off because one of his dubious experiments set fire to the car, became a telegraph operator, began to invent and became the greatest inventor of the age, having taken out no fewer than 1328 separate patents from 1869, the date of his first patent, up to the summer of 1910.

When Edison, fresh from his great successes in the quadruplex telegraph, the telephone transmitter and the phonograph, threw himself on the problem that had practically been abandoned as hopeless, work went on incessantly day and night in those years of 1878 and 1879.

After much experimenting he came at last to bamboo for the filamentary material to be put into his incandescent lamps. For nearly ten years the Edison lamp was made with bamboo filaments; but Edison himself did not regard the bamboo lamps as the "last word." Paralleling the carbon filament lamps of bamboo, there soon appeared the "squirted" filament, employing carbonized cellulose in one form or another. Another advance was embodied in lamps still of the carbon type, in which the filaments were strengthened by such substances as would justify calling them "metallized." The mere word was a revelation as to the direction in which the art was tending, and very quickly real metallic filaments were on the market and available to the public.

The introduction and general adoption of the mazda tungsten lamp has been literally nothing short of a revolution in the art of interior illumination, with a correspondingly tremendous effect on exterior lighting. Working down from a consumption of 4 or 5 watts of electrical energy per candlepower in Edison carbon filament lamps to the standard a few years ago of 3.10 watts per candlepower, the mazda lamp has brought that down in about five years to 1.25 watts; while in the larger sizes of mazda



THOMAS ALVA EDISON.

gas-filled lamps, the reduction in current consumption has reached the low point of a half-watt per candle.

Because the electric incandescent lamp is a scientific and an industrial achievement in the aspects of its development and perfection, it is but natural that those actively engaged in the manufacture and distribution of Edison Mazda lamps should participate in making Edison Day one of the red letter days in the lighting industry. The Edison Lamp Works of General Electric Comany therefore launched coincident with the anniversary the most complete and comprehensive campaign of propaganda for the purpose of popularizing electric lighting ever undertaken. The scope of the propaganda was nation-wide and embraced nearly every avenue of public appeal. Over 12,000,000 copies of seventy popular, trade and technical magazines and newspapers carried Edison Day announcements to every nook and corner of the United States, reinforcing in a most effective manner local campaigns of the central stations and dealers.

Barrett Specification Roofs

On great manufacturing plants

BARRETT Specification Roofs are so generally used on great manufacturing plants that specifying this type may truthfully be described as "standard practice" among first-class architects and engineers.

Here, for example, is illustrated the eleven-acre plant of the Norton Company, at Worcester, Mass. Some of these buildings are very old, but they are all covered with felt and pitch roofs laid along the lines of The Barrett Specification.

Such roofs will usually last twenty years without maintenance cost of any kind. Sometimes they last up to thirty years.

They invariably show a lower unit-cost (that is, cost per foot per year of service) than any other roof covering known.

Barrett Specification Roofs take the base rate of fire insurance, because they are recognized as non-inflammable.

A copy of The Barrett Specification with roofing diagrams mailed free on request.

HYDRONON
The Damp-proofing Paint
Especially recommended for use above the ground level on the interior of stone, brick or concrete walls to exclude dampness.
Has superior covering capacity and is vastly superior to other paints in its permanence and resistance to dampness. Booklet on request.

TAR-ROK SUB FLOORS
This construction provides the most suitable surface on which to bed plank (without the use of sleepers) where a wooden lower floor is desired in factory, machine shop, storehouse, etc., effecting a maximum of strength, rigidity and protection against dry rot, decay or fire, at a nominal cost. Booklet on request.

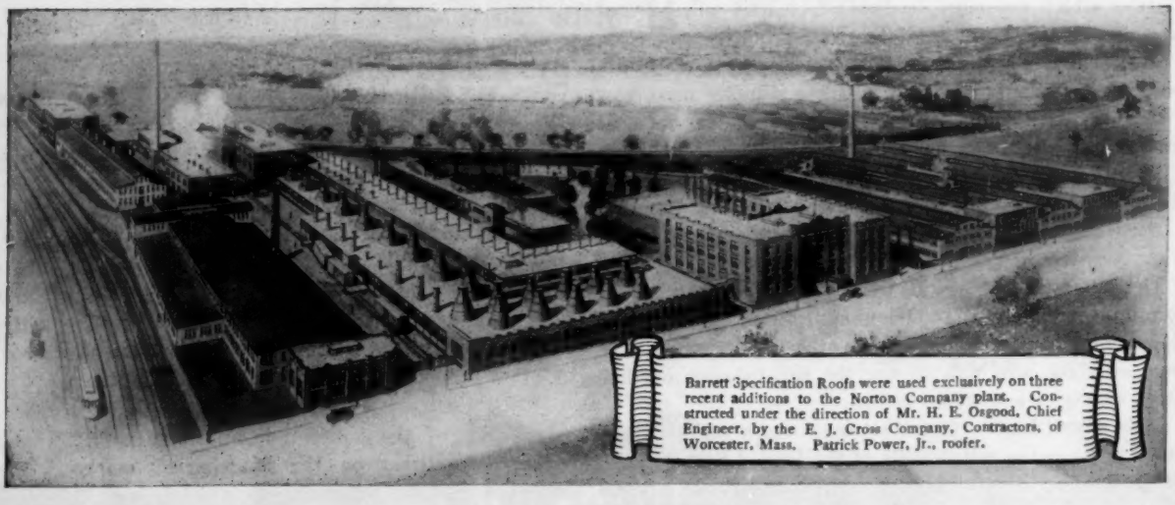
Special Note We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested:

ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified and subject to the inspection requirement.

BARRETT MANUFACTURING COMPANY

TRADE B MARK

New York Chicago Philadelphia Boston St Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.



Barrett Specification Roofs were used exclusively on three recent additions to the Norton Company plant. Constructed under the direction of Mr. H. E. Osgood, Chief Engineer, by the E. J. Cross Company, Contractors, of Worcester, Mass. Patrick Power, Jr., roofer.

"Cotton Chats" on the Outlook.

Wars and rumors of wars have for the past two months held the attention of the civilized world to the exclusion of everything else.

The scare headlines of the daily papers on other subjects as recent as the middle of July have faded from memory as completely as last year's rainbows. Everything is overshadowed by the seriousness of the European war and its far reaching consequences.

This country is fortunate in being geographically free from what might lead to complications involving the United States in possible war, even against her wishes.

Meantime our nation with all other nations of the world must contribute either directly or indirectly towards the enormous expense resulting from the loss of life and property. For the time being our industries are crippled; markets for our manufactures and other products must be readjusted; credits are scrutinized and rates for money high.

As regards cotton manufacturing, our mills will be called upon to supply their legitimate home market with millions of dollars worth of fabrics which have until within a few months been imported.

The number of cotton spindles in use prior to this war in the large cotton manufacturing countries was divided about as follows:

Great Britain	55,300,000
United States	30,300,000
Germany	10,700,000
Russia	8,800,000
France	7,400,000
India	6,100,000
Austria	4,800,000
Italy	4,500,000
Spain	2,200,000
Japan	2,200,000
Switzerland	1,400,000
Belgium	1,400,000
All other countries	5,400,000
Total	140,500,000

Of this number Great Britain, Germany, Russia, France, Austria and Belgium represent about 88,400,000. Including a share of the spindles of Italy, Switzerland and other countries which are more or less affected, it will be seen that fully nine-fourteenths of the cotton fabric production of the world is for the present practically at a standstill. The market formerly supplied by these spindles must now be supplied by the balance of the world, as far as it is supplied at all.

Meantime hundreds of thousands of the most efficient men of the countries at war are being killed or crippled, so that the world's productive labor capacity is being seriously reduced.

The latest reports of the United States Census Bureau show approximately 1,500,000 unnaturalized foreigners in this country owing allegiance to the countries at war. Many of these men will answer the call to arms of their native countries and never return.

It is a well known fact that there was a serious shortage of labor in the cotton mills of the United States during the prosperous times of 1906 and up to the panic of 1907. There is every reason to believe that there will be a still greater shortage when the tide again turns and our manufactories are busy. To prepare for that condition the only logical course in case of the cotton mills is the continued introduction of automatic machinery.

As the weave-room in a mill having common looms represents one-half the labor cost of the cloth, the Northrop automatic loom which saves from one-half to three-quarters of the labor cost of weaving is a most important factor in equalizing conditions, both in the interests of the mills and of the people employed, as it increases the earning power of the weave-room and also of the weaver.

Bulkhead to Resist High Pressure Wins.

A paper by W. L. Wise and W. Strache, published in the August Bulletin of the American Institute of Mining Engineers and in the Engineering Record of October 10th, describes an interesting case of waterproofing at the Hibernia Magnetite mine, New Jersey. The tunnel was formerly closed by a mass of rock which leaked about six gallons per minute. It was decided to replace this by reinforced concrete which was waterproofed as follows:

The pressure face of the bulkhead was covered with 3 inches of Impervite waterproofing compound deposited behind steel plates built up with concrete. The work was not contiguous and whenever it was interrupted large stones weighing about 100 pounds each were set 6 inches apart in the upper surface of the concrete mass and projecting from it and plastered with 1 and 1 mortar when the work was resumed. When the roof was reached, false forms were placed and the work was finished with tightly bonded dovetailed blocks. Seven 2 inch grout pipes, four on the pressure side and three on the opposite side, were placed in the concrete as the work neared completion. Thirty-six hours after the concrete was finished grout made with 1½ parts of sand and 1 part of cement mixed with water-dissolved Impervite was forced through the pipe under a pressure of 85 pounds per square inch. Two weeks after the completion of the bulkhead it was subjected to a pressure of 160 pounds per square inch. The result was a seepage of only ½ gallon at first, and this afterward almost entirely ceased. Impervite is a waterproofing material manufactured by THE STANDARD PAINT CO., 100 William Street, New York City.

There are still some textile manufacturers who use tallow as a softener. They should try the soluble softening oils made by THE ARABOL MFG. CO., 100 William Street, New York City. The manufacturers claim such men would be astonished at the smooth finish of the warps, the easy parting of the threads in the lease rods, the bright and clear appearance of the slasher cylinders. Especially fine results they would obtain with closely woven goods, such as corduroys, velveteens, sateens, umbrella cloths, cambrics, etc. The seasons have no influence on soluble softening oils; it remains sweet, uniform and pliable, summer and winter; it is neutral and easily blended.

Copies of the bulletin, "Cotton goods in Japan and their competition on the Manchurian market," Special agent series No. 86, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 30 cents each.

THERE IS
NO RUBBER
IN THE COMPOSITION
OR PRONUNCIATION OF
RU-BER-OID

¶ This great roofing has a good name and deserves to have it pronounced correctly.

RU-BER-OID
PRONOUNCED
"RU" as in RUBY
ALWAYS SPELLED WITH
ONE B

¶ RU-BER-OID Roofing has weathered the storms of over 22 years, and the onslaughts of imitators for almost as long.

¶ RU-BER-OID has been to the South Pole with Captain Scott and to the North Pole or thereabouts with various other explorers.

¶ And to all intermediate points has RU-BER-OID gone—invairably doing what is claimed for it.

¶ KA-LOR-OID (colored RU-BER-OID) is the same durable material with the added attraction of beautiful and permanent colors—Tile red—copper green.

Send for Samples.

The Standard Paint Company

100 Williams St. New York

IMPERVITE

Building Materials Now Made of Rock.

The marked increase in disastrous fires is directing more attention every day to the need of fireproof building materials that can be relied upon. The failure of many so-called fireproof materials when subjected to the intense heat of large conflagrations suggests the need of more careful judgment in the choice of these materials as well as a more stringent interpretation of fireproof building regulations.

The demand for building materials that would not be affected by fire has encouraged manufacturers to experiment with all kinds of materials, but the only one that has thus far successfully withstood all tests is a peculiar rock known as asbestos.

Asbestos runs in veins usually nearly parallel to the ground, in various thicknesses from a mere line to three or four inches thick. Some of these veins, however, reach a depth of 200 feet. In mining this rock, after removing the surface of the earth, the rock is drilled and blasted the same as granite or any other stone.

Deposits of asbestos, in one or more of its allied species, are found to a limited extent in Russia, Italy, Egypt, India, South Africa and, in fact, in all parts of the world. But that which is mined in Canada is about all that is of much commercial value as other varieties are either too brittle to utilize or too hard to mine. By far the largest of these Canadian mines is owned by the H. W. Johns-Manville Co., of New York.

This asbestos rock, when properly worked, produces long silky fibres, which are manufactured into fireproof goods of various kinds, the most familiar of which, no doubt, is the asbestos theatre curtain.

These asbestos, or rock fibres are made into felt, much along the line that the felt for hats is manufactured. This felt is then saturated with Trinidad Lake asphalt, after which several of these sheets are cemented together with this material and thus made into ready roofings.

For shingles, these same rock fibres are mixed with portland cement and other ingredients, put into moulds of various sizes and shapes, and subjected to intense hydraulic pressure. The various colors are mixed with these ingredients, producing shingles of a number of handsome shades.

Asbestos wood or lumber is also made in very much the same manner as the shnigles. This is furnished in slabs of varying sizes, so that it can be easily used for making fireproof partitions, fire doors, booths for moving picture machines, etc.

Another use that is made of this material is in stucco, also wall plaster. Here the asbestos fibres take the place of hair ordinarily used and the asbestos rock takes the place of sand.

Then there are pipe coverings and a number of other things used in building construction made of this peculiar material.

Another material which is fast gaining favor, chiefly because of it fire retarding qualities, is mastic for floors.

The importance of fireproof construction can not be over estimated, and that architects and builders are fast realizing this is shown by the big increase in the substitution of fireproof building materials for those of an inflammable nature.

The German Embargo.

As announced in many quarters, the German Government on September 22nd placed an embargo on the exportation of dyestuffs, only to be raised under the following stipulations, quantities exported must not be greater than usual amounts reaching America, shipments must be in American bottoms and guarantee must be given against re-exportation. On September 30th, at the invitation of the Department of State, a conference of importers and consumers was held in Washington at which the CASSELLA COLOR COMPANY were represented by their vice-president, and a committee was appointed to meet the emergency, of which the Hon. H. A. Metz was made chairman. The American S. S. "Matanzas" has been chartered in the name of A. M. Patterson, president of The Textile Alliance, and is now en route to Rotterdam in ballast. In this boat, it is understood, all the large dyestuff houses have been alloted space. The source of supply of this Company has been notified and will meet the "Matanzas" with such quantities as are authorized by the German Government. These goods should reach New York by the latter part of November. Meanwhile, they announce with regret that there appears to be but little dyestuff on the way, the embargo having held up goods in transit and shipments crossing the frontier prior to the 22nd of September having very generally reached port. As far as their observation goes, the "Matanzas" should finish its errand auspiciously, for the English authorities have made no objection to the arrival of dyestuffs in bottoms of any neutral power, and we have assurances that they are likely to continue this attitude. We regard it as unfortunate, however, that conditions have brought about a situation opposed to the classic warnings against "having all eggs in one basket." Negotiations have now been initiated with the Holland America Line with a view to adding to their fleet a regular boat under the American flag. The American agents of the Holland America Line have met this proposition in a sympathetic attitude, and upon receipt of approval from their home office it is expected that they will be in a position to offer the dyestuff trade regular freightage which will fully comply with the requirements of the German Government as at present understood.

The Right Way to Help the Cotton Planters.

The "buy a bale of cotton" movement is only sentiment and merely a temporary help, as cotton so bought is placed in storage, only to be thrown upon the market at a later date. To use and consume a bale is permanent and every one is in a position to help the planter through this method.

THE D. P. WINNE COMPANY, INC., 105 Worth Street, New York City, is well known as the oldest twine house in New York. This company has studied cotton for 15 years and has developed new uses for it which were formerly filled by using jute, hemp and flax. They are lending their aid in the "consume a bale of cotton" movement by offering to send to present users of twine made from jute, hemp or flax, a sample ball of their twine made from cotton in exchange for a ten foot sample of the twine made from some other fibre and used at present. This ten foot sample allows them to select a sample ball of cotton twine of similar or better strength and quality and at a price consistent with prices formerly paid by the user.

"The fuses that save 80% per year" are the logical fuses for you to use—

ECONOMY renewable cartridge FUSES

are giving positive electrical protection and cutting fuse maintenance 80% in great industrial plants, central stations, mines, department stores, steam and electric roads, etc.

ECONOMY renewable cartridge FUSES are the only renewable fuses uniformly rated—the Economy design is the only design so far produced that provides the desired electrical characteristics. All capacities of renewal elements are readily available, making large fuse stocks unnecessary. ECONOMY renewable cartridge FUSES never vent fire nor hold a sustained arc—they are absolutely safe. Now available in knife blade and ferrule types.

Special Announcement

Two renewal elements are now furnished (without charge) with each Economy fuse. Now you figure what fuse is the cheapest, not only to buy, but also to maintain.

Bulletin No. 7 and Samples on Request. Write now

Economy Fuse & Mfg. Company, Kinzie & Orleans Street, Chicago, Ill.

Your aim is to weave Better Fabric at Less Expense

Our Aim is and Always Has Been To Make the Shuttle That Will Help You Most in Accomplishing Your Purpose.

Hundreds of our steady customers have found that their

Increased and Better Woven Yardage

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Cost of the Necessary Shambow Shuttles

A Minimum Shuttle Expense Per Yard.

¶ When you weave with **SHAMBOW SHUTTLES**, you will note your lowered shuttle expense and fewer annoying shuttle smashes; also that your percentage of seconds diminishes, and that your filling bobbins last longer; in all, that Shambow Shuttles weave better fabric at less expense.

Send sample shuttle and completely filled bobbin with your order for our design of efficiency shuttle approved by loom builders.

SHAMBOW SHUTTLE COMPANY WOONSOCKET, R. I.

The Onofrezo Fire Extinguisher.

A practical non-freezing fire extinguisher has been the dream of nearly all men engaged in the fire extinguisher business, and has been tried out by most of them in the past. The nearest they came to accomplishing this was an extinguisher with gas compressed in a steel capsul, air pressure, or a double action pump. In the first two they were never sure of the pressure, and with the pump the attention of the operator is divided and the stream nearly always weak and uneven.

THE ONOFREZO FIRE EXTINGUISHER MFG. CO., 214 South Seventeenth St., St. Louis, Mo., use a hermetically sealed metal can with the chemicals so arranged that they remain inert until wanted and will not freeze at 50 degrees below zero, F.

The chemicals when united within the can form a powerful gas pressure, adaptable to any size extinguisher. Any fire extinguishing liquid may be used as the chemicals in a crude form do not come in contact with it, the gas only escapes from the can furnishing the expelling force. This invention can be applied to all existing types of fire extinguishers from one quart to large chemical engines, while the fact that it is non-freezing will make it possible to use it in elevators, warehouses, etc.

In the quart extinguishers, carbon tetrachloride, being devoid of moisture, can be used on electric and oil fires where the ordinary extinguisher would be dangerous or non-effective. Calcium chloride is used as the extinguishing agent in the larger sizes of hand chemical extinguishers and chemical engines. It is non-freezing and less expensive than carbon tetrachloride and on ordinary fires is more effective than soda and acid extinguishers. When this device is used in chemical engines, it obviates the necessity of keeping the engine in specially heated houses. Many small towns need and can afford to purchase a chemical engine when they cannot afford to build and maintain an engine house to keep a chemical engine from freezing.

The following is an extract from the Journal of American Society of Naval Engineers, February, 1913:

Carbon tetrachloride is a clear liquid which volatilizes at 77 degrees Centigrade. (138 degrees F.); neither it nor its vapor being combustible, nor will it support combustion. Carbon tetrachloride has a strong, rather pungent and unpleasant odor, though its vapor is not poisonous if inhaled. It costs about $1.75 per gallon, and can be obtained readily commercially. It is non-corrosive to metals and does not damage textiles. It is a non-conductor of electricity and can be used on electric ares and fires in electrical apparatus. Carbon tetrachloride has all the properties necessary to form an admirable fire extinguishing agent, and several systems that have achieved great popularity recently, depend on it for their efficacy. It is especially effective on gasoline and fuel oil fires, as the heavy vapor caused by its evaporation quickly blankets the burning oil and stops the combustion. For this reason patent extinguishers containing it are generally used in automobiles and motor boats. In the latter particularly, fires, otherwise difficult to combat and offering serious possibilities, can be extinguished quite readily by the use of carbon tetrachloride extinguishers.

The manufacturers of some of the patent extinguishers in which a liquid of this type is employed, claim that they do not use carbon tetrachloride or else that they have increased its efficiency by the addition of secret ingredients. It seems probable that these claims are advanced to justify the higher price charged for the liquid than the commercial price of carbon tetrachloride. Water, such as sea water, containing salt, or any other similar solid in solution, is a more effective extinguisher than fresh water, as the solid, deposited by the evaporating water on a burning surface, retards the combustion and renders the fuel less easily inflamed. These not only increase the fire extinguishing properties of the water, but serve the important function of reducing its freezing point, so that in cold weather it does not freeze. Calciulm chloride is probably most generally used for this purpose.

An Interesting Booklet.

FOREMEN AND ACCIDENT PREVENTION is the title of a booklet just issued by the TRAVELERS INSURANCE COMPANY, Hartford, Conn. This book is based upon the extensive experience of the Travelers Company in practical accident prevention work. It is addressed to foremen but it is intended for the use of all persons holding positions of authority. It should be studied in connection with the companion booklet previously issued by the Travelers Insurance Company under the title "The Employee and Accident Prevention". This present booklet approaches the subject from the standpoint of the executive and administrative department and gives suggestions with regard to the management of the workers and the improvement of the plant with a view to increased safety.

Believing that such a booklet would be more useful if it were small and compact, it has been made in pocket size and the attention is confined mainly to points that are found by experience to be of great importance in all industries. Inquiries in regard to points that are not covered in the pages of the book, or which owing to the difference of unusual conditions might require more elaborate discussion than has been given, will be given careful attention by the engineering and inspection division of the company.

AMERICAN COTTON CROP MOVEMENTS based upon the reports of the New York Financial Chronicle, the New York Cotton Exchange, and the United States Agricultural Bureau, has again been issued with the compliments of HUBBARD BROS. & CO., cotton merchants, Hanover Square, New York City. This handy little booklet of statistics which is issued annually by Hubbard Bros., will find its usual cordial reception on the desk of the busy man.

Eureka Fire Hose "Buys a Bale."

The whole country seems to be interested in the "Buy-a-Bale" movement. Various people North and South have bought bales. THE EUREKA FIRE HOSE MANUFACTURING COMPANY of New York, who conduct a large business throughout the cotton growing states, appreciated the lack of market for the raw staple caused by the European war, and rendered their part toward helping the South dispose of their excess cotton crop by purchasing 2,000 bales or approximately one million pounds of cotton.

Foreign army contractors and export shipping merchants in New York are desirous of securing exclusive export agencies on a commission basis with manufacturers of Underwear, Hosiery, Army Blankets, Absorbent Cotton and other lines now required for foreign army supplies and export requirements. Advertisers have large requirements now in hand for some of these articles on which they are prepared to pay cash.

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care "Cotton," Atlanta, Ga.

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ABSOLUTE protection from the elements is assured the house roofed with Cortright Metal Shingles.
They interlock and overlap so that no snow or rain, spark or ember can penetrate.
Adaptable to any building, in any climate. Valuable book on roofing sent free on request.
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PERFECT BALANCE.
NO CHANGING SLOT.
TWIST RETAINED.
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LESS DOFFING, HANDLING, SETTING IN, PIECINGS AND WASTE.
Costs No More
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It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.
It saves time, labor, machines and cloth.
YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.
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KNITTING MILL NEWS.

Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.

DELAWARE.

WILMINGTON. The Nuidea Knitting Company, recently incorporated with a capital stock of $50,000, will make neckwear, hosiery and other fabrics. Its president is John L. Sutphen.

MASSACHUSETTS.

SPRINGFIELD. The Potter Knitting Co., started Saturday, October 10, an exhibit of the methods used to make Bedo brand underwear in the store formerly occupied by the W. J. Woods Co. Machines were in actual operation showing yarn being knitted into cloth and other processes. One week later, October 10 to 17, they put on sale at the principal stores in Springfield Bedo brand underwear at greatly reduced prices.'

MINNESOTA.

MINNEAPOLIS. The Northwestern Knitting Company's first unit of the new plant has been completed and when the second unit is ready the total enlargement will be 397 x 82 feet. It is eight stories and a basement and has a thorough equipment.

MINNEAPOLIS. Wyer & Tosney, knit goods manufacturers, have installed the German machines recently received in their mill. This is part of an order given to a firm in Saxony.

NEW YORK.

ALBANY. The American Beauty Knitting Mills, New York City, have been incorporated with a capital stock of $20,000 to manufacture hosiery and underwear. Charles L. Friedman, Henry Gottlieb and Abram Goldberg are the promoters.

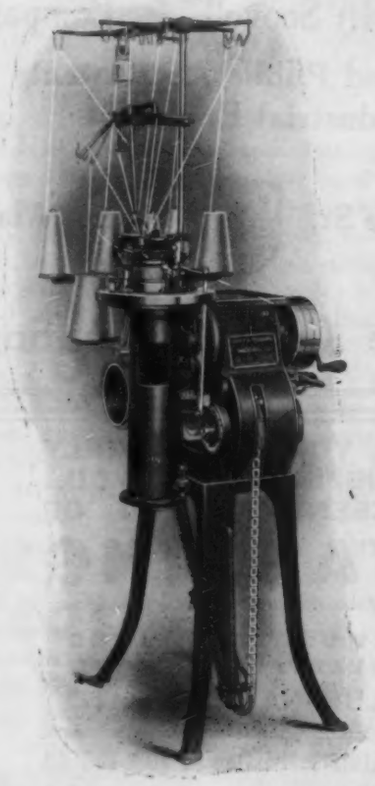
MECHANICSVILLE. The plant of the Union Mills is reported working night and day to fill a rush order for men's fleece lined underwear that is to be shipped to England and which is reported to be for use in the English army. It is expected that the night and day force will be kept busy several months until the order is completed. It has been necessary for the company to employ about 50 additional hands.

PENNSYLVANIA.

CATAWISSA. It is reported that the old Catawissa Knitting Mill which has been idle for some time has been leased for a period of five years by Harry West, son of Thomas West, proprietor of the Wyoming Valley Knitting Mills. It is understood that Mr. West will install 35 new machines in addition to the 50 machines already in the plant and will start operations as soon as possible.

DOVER. The Dover Hosiery Mills, which were closed for two weeks, have resumed operations, with a full force of hands.

GERMANTOWN. The Cheltenham Knitting Company of this city is reported to have good orders on hand for underwear and sweater coats. Wilcomb, Crane and Wildman machines are used in the underwear department and Leighton machines for the sweater goods.



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You can now make half hose with a saving ranging from 7 to 15c per dozen.

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